

True-to-Schedule Tire Service

Daily, in all weathers on all roads, Firestone Bus Pneumatics are giving reliable "true-to-schedule" service.

Gum-Dipping is largely accountable for this performance. This exclusive Firestone process insulates every fiber of every cord with rubber; minimizing friction and heat and building greater strength and flexibility which mean extra comfort for passengers and added prestige and patronage for the operator. The broad tread of this tire, with its great volume of rubber, affords deep cushioning—added protection to chassis and body.

Firestone Engineers are specialists in suiting the right tire to the truck or motorbus it must carry. Their advice, added to your dealer's knowledge of local conditions, insures you the equipment, which under all circumstances, will give most efficient service with the economy of—

MOST MILES PER DOLLAR



Firestone

TRUCK AND BUS PNEUMATICS

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER . . . *Harvey Firestone*

Light on the Bus Braking Question

The A B C's of Bus Brakes and Braking Systems

Curing the Skid

Skidding when brakes are applied can easily be cured. It is due, primarily, to the application of unequal braking pressures. One wheel absorbs most of the braking effect, becomes locked, and the vehicle pivots, with consequent loss of control, abrasion of tires, and strain on the chassis; if indeed nothing more serious in the form of an accident occurs.

While skidding may never be entirely eliminated, the most dangerous source of skids can be removed by using a braking system that automatically applies equal braking power to wheels on the same axle regardless of band wear, or any other such variable factor.

It is plain that such a system must transmit its power by a fluid—air, oil or a similar agent. It must apply its power directly, without the complication of levers, pull-rods, shafts, knuckles and cams. The greater the simplicity, the easier to maintain equal pressures.

In a brake system that uses fluid for power transmission, the pressures applied to the brake actuating mechanisms on the same

axle *have* to be equal. It is impossible that they be anything else. With the simplest possible brake operating mechanism,—without a lever, pull-rod, cam system—the ideal of a perfectly equalized braking pressure that automatically maintains its equalization is attained. IN NO OTHER WAY IS IT POSSIBLE.

Furthermore, perfect self-equalization of braking pressure makes possible employing the safe use of brakes on ALL wheels; distributing the braking load and making locked wheels far less likely.

Skidding when brakes are applied can be practically done away with, if truck owners select their brakes with an eye to what has been written above.

This is the fourth of an informative series on Bus Brakes. The series consists of:

- A—What Brakes Must Do.
- B—How many wheels should brakes go on?
- C—Self-equalization and brake adjustments.
- D—Curing the Skid.
- E—Metal to Metal or Moulded Linings—which?
- F—Braking Power.
- G—Compressor Mountings and Drives.
- H—Compressor Cooling.
- I—The Control Valve.
- J—Maintenance on Different Types.

The other topics will appear in the above order. Address any comments, suggestions, or requests for advance information to—

The Christensen Air Brake Co.
6513 Cedar Ave., Cleveland, Ohio

Christensen

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Electric Railway Journal

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Getting the Most from the Index

This is essentially a subject index, not an index of titles, and articles treating a number of different subjects are listed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about an electric railway are under the name of the city in which the main office of the company is located, but in the case of electrified sections of steam railroads, the entries appear under the name of the railroad.

In the subject index, the alphabetical method is followed. If there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below is a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into fourteen general subjects.

The headings which appear in the index itself are in small type under the general classifications. The main headings in capitals below do not appear in the index. The list of keywords is revised from time to time

to keep the index abreast with developments.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question. The reader would therefore refer to this keyword under S in the body of the index.

In addition to the groups of articles covered by these headings, papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short articles about machine tools appear only under the heading "Repair shop practice; shop methods and equipment" and are not indexed alphabetically, because there is a wide choice in most cases of the proper keyword to be used.

Signed articles also are indexed by the name of the author. When the name of the author is known to the reader this provides the simplest method of locating any article.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION

Accident claim department
Accident prevention
Accidents (including wrecks)
Insurance, Fire
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS

Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT

Bearings
Brakes and compressors
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Resistors
Seats
Trolley wheels
Trucks
Wheels and axles

EMPLOYEES

Education
Employees
Insurance and pensions
Labor
Strikes and arbitrations
Wage decreases
Wage increases
Wages and working agreements

FARES

Fare collection (including apparatus)
Fare decreases
Fare increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS

Accounting
Appraisal of railway property
Blanks and forms
Discontinuance of lines
Financial (methods of financing)
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

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Locomotives

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Lubrication
Maintenance practice
Motor buses, Practice with
Painting
Repair shop practice; cars and car equipment
Repair shop practice; shop methods and equipment
Repair shops and equipment
Stores
Tests of materials and equipment
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Motor buses, field for
Motor buses, installations
Motor buses, jitney competition
Motor buses, operating practice
Motor buses, regulation

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Energy consumption
Fuels
Overhead contact system

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Power generation
Power stations and equipment
Power transmission
Substations and equipment

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Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals and waiting stations

TRACK

Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
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Track maintenance

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Advertising
Customer ownership
Dispatching
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Merchandising transportation
Parking of cars
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Schedules and timetables
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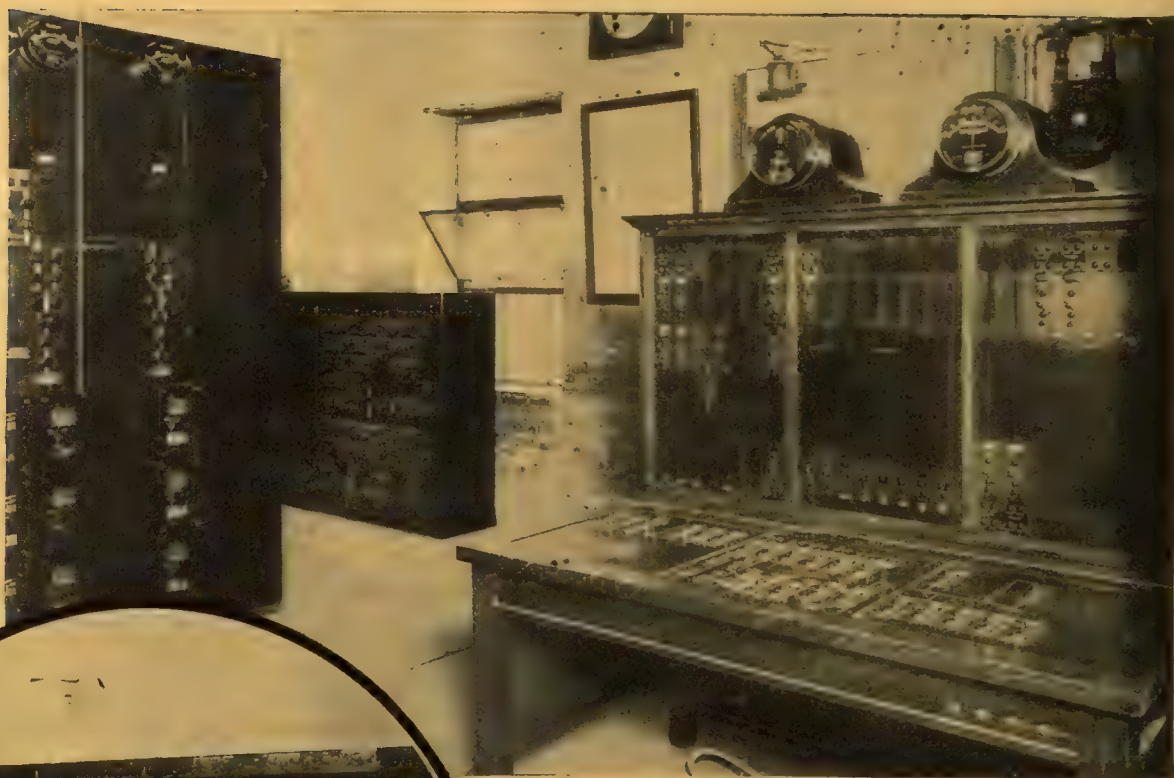
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Fact or Fancy

EXPLORERS are constantly extending that portion of our globe about which we have definite knowledge. Only recently two parties have made flights over the vast unexplored area near the North Pole. They brought home accurate reports and dissipated many vague rumors concerning that unknown land.

Often returning travelers bring back strange and unlikely tales concerning the transportation systems in foreign countries. Experienced American railway operators usually are skeptical of such stories, but there is little opportunity to discover from the daily press whether they are fact or fancy.

For this reason, ELECTRIC RAILWAY JOURNAL regularly devotes a considerable amount of space to foreign transportation matters. All important developments are covered either as news items or in longer technical articles.

In some cases the foreign practices thus presented may be an improvement on those followed in this country. In other cases, perhaps, they are impracticable under the conditions existing here. However that may be, American operators are kept thoroughly posted concerning the state of the industry throughout the rest of the world. For the readers of the JOURNAL there is no far-away undiscovered land of fanciful transportation development. Definite knowledge has replaced vague rumor.

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You can sell safe, smooth, swift, silent and satisfactory service only on well-maintained track.

The surest way to maintain track is to maintain the rail. For that purpose the welding and grinding equipment here shown provides the most economical and most effective method.

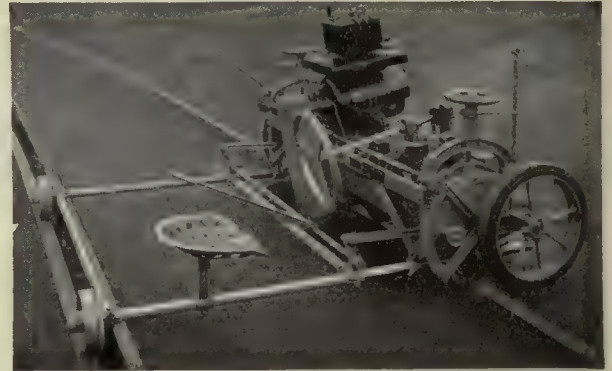
*Quotations by wire
if you are in a hurry.*

Railway Trackwork Co.

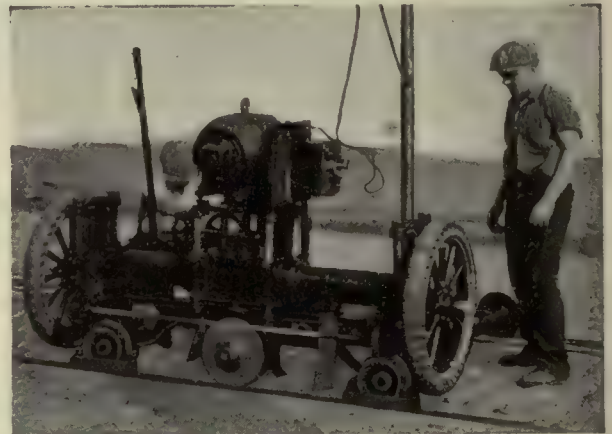
3132-48 East Thompson Street, Philadelphia

AGENTS:

Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
H. F. McDermott, 208 S. LaSalle St., Chicago
Equipment & Engineering Co., London
P. W. Wood Railway Supply Co., New Orleans, La.
Frazar & Co., Japan



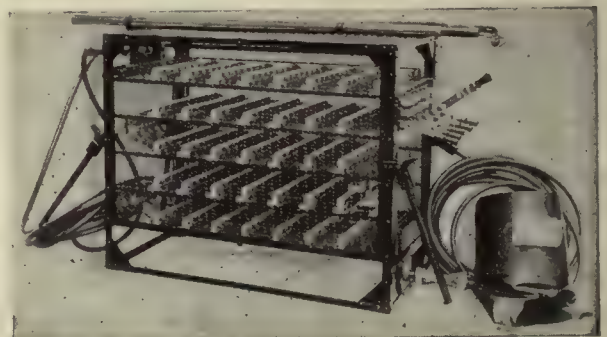
"Improved Atlas" Rail Grinder



"Imperial" Track Grinder



Reciprocating Track Grinder

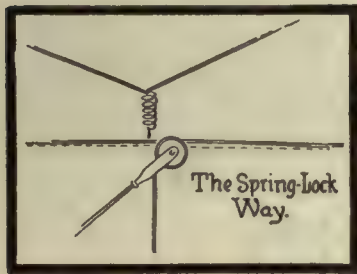
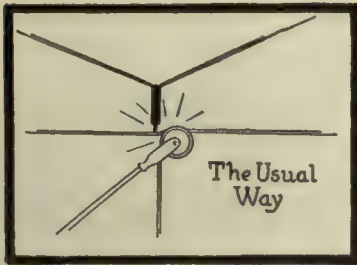


"Ajax" Electric Arc Welder

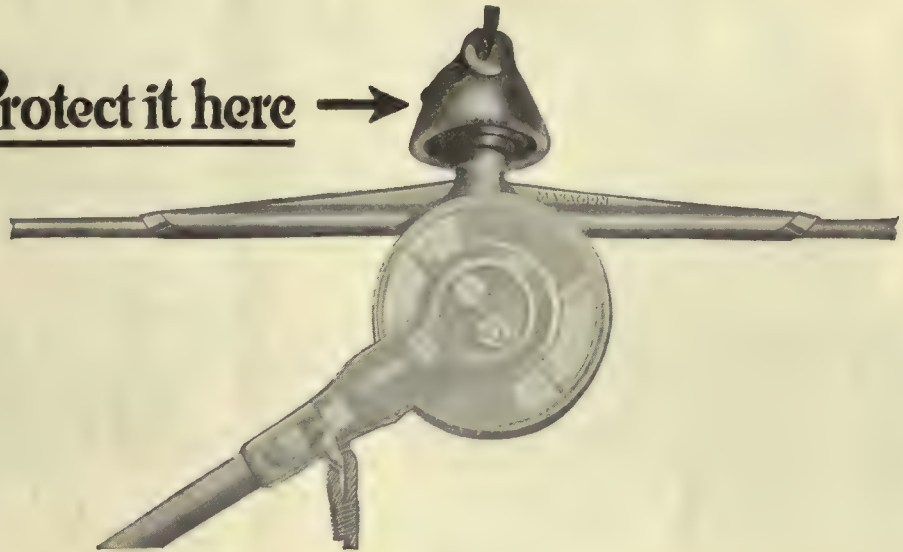
1187

SAVING THE RAIL SAVES THE RAILWAY

Give Your Overhead a Chance

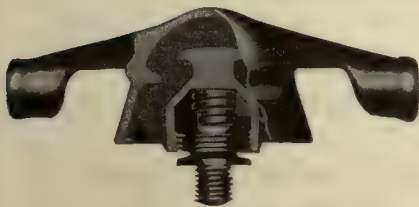


Protect it here →

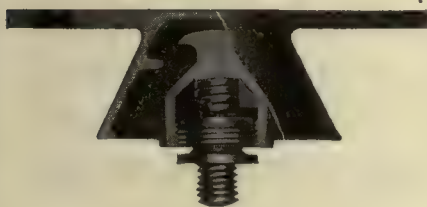


O-B Spring Lock Hangers Are Like Shock Absorbers on the Line

For Span



For Bridge or Barn



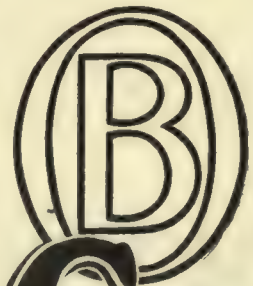
THREE YEARS' USE on many properties has shown that O-B Spring Lock Hangers last longer and prolong the life of both ear and trolley wire by cushioning the hammer blows of the trolley wheel.

Impact is absorbed by a coil spring placed between the stud and hanger body. This spring lasts for years because it is compressed only when the trolley wheel passes directly under the hanger. A fibre grease packing in the spring chamber excludes moisture and prevents rust. The trolley ear threads tightly against the bronze collar on the stud. Turning the ear back into line with the trolley wire does not disturb this tight connection.

O-B Spring Lock Hangers are especially desirable for car houses, underpasses and troughs. But many companies use them for their entire overhead, so marked is the improved smoothness of operation. A notable reduction of the noise within the car is also effected.

Ohio Brass Company, Mansfield, O.
Dominion Insulator & Mfg. Co., Limited,
Niagara Falls, Canada

76B



Ohio Brass Co.

PORCELAIN INSULATORS • LINE MATERIALS • RAIL BONDS • CAR EQUIPMENT • MINING MATERIALS • VALVES



SPEAKING of MODERN CARS

EVERYONE is talking about the "modern car!" At the last American Electric Railway Association Convention, speakers brought out the fact that there are more than 25,000 cars still in service, all over eighteen years of age. They should be replaced.

When considering the modern car, be sure the wheel equipment is modern, too.

Davis "One-Wear" Steel Wheels fulfill modern car requirements. They are lighter than the ordinary wheel. They are much stronger, which aids in noise-reduction through reduction of flats.

Economy, the main idea in the modern car, is attained, because Davis "One-Wear" Steel Wheels require no shopping for contour reconditioning. They last longer, with less maintenance expense.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



EUCLID AVENUE, CLEVELAND



NAZARETH, PA.

Big City or Small Town

THE ready acceptance Twin Ties have in both the large city and small town, make us feel sure we have something to offer both.

The first-cost economy of the Twin Tie design makes the biggest appeal on the small property.

The increased life of track and the renewable design, both based on actual experience and practice, influence the large city properties to use **STEEL TWIN TIES**.

The volume of Steel Twin Tie Track is, of course, laid in the cities because that is where the volume is.

We have analyzed in the table where the work now in progress is being done, to indicate this more clearly.

Analysis of 28 Twin Tie Installations
Now in Progress

CITY-POPULATION	Number of Cities or Towns
1,000,000 and over	2
750,000 to 1,000,000	1
500,000 to 750,000	3
200,000 to 500,000	3
100,000 to 200,000	3
50,000 to 100,000	7
Under 50,000	9

May we send Catalog and Quotation?

The International Steel Tie Company
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track . . . Permanent Foundation

Signals

and their Diversified Applications.

Have you more than scratched the surface to uncover available means of protecting and speeding up your traffic, and are you experiencing delays or perhaps accidents which might be eliminated by the use of one or more of the following means?



1.—Automatic semaphore or color light block signals, controlled by continuous track circuits.



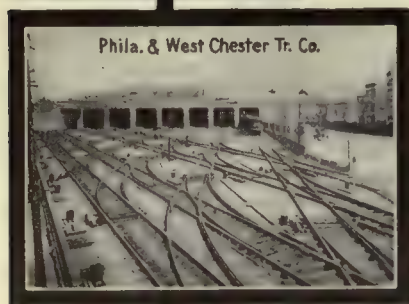
2.—Electro-pneumatic, electric, electro-mechanical, or purely mechanical interlocking systems at terminals or at grade crossings with other railway lines.



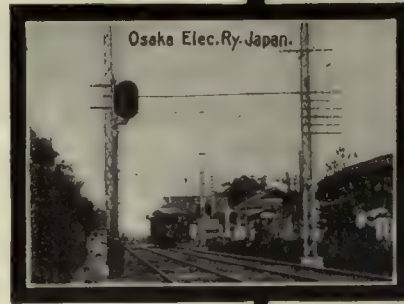
3.—Highway crossing protective devices of flashing color light, wig-wag and audible types or combination of same.



4.—Remotely controlled switches at outlying sidings.



A statement of your problem places you under no obligation and if it appears to our engineers that your conditions can be improved by installation of our materials, we shall be glad to furnish complete details.



Electric Railways which are large users of Union automatic signal and interlocking systems are:

Chicago, Lake Shore & South Bend Ry. Co.
Chicago, South Bend & Northern Indiana Ry.
Kansas City, Clay County & St. Joe Ry. Co.
Washington, Baltimore & Annapolis Elec. R. R.

Interstate Public Service Co.
Pacific Electric Ry. Co.
Illinois Traction System
United Elec. Rys. Co.

Scranton & Binghamton R. R. Co.
United Railways & Elec. Co.
San Francisco-Sacramento R. R.
Northern Texas Traction Co.



Union Switch & Signal Co.

SWISSVALE, PA.





Independence Hall—Philadelphia
Floodlighted with Golden-Glow
Projectors.

City Hall—Philadelphia
Floodlighted—Many Golden
Glow Projectors are used.

PHILADELPHIA has invited you to participate in her Sesqui-Centennial Exposition, commemorating one hundred and fifty years of glorious history and uninterrupted progress.

And the Electric Service Supplies Company, for many years one of Philadelphia's leading industrial concerns, welcomes you. A cordial invitation is extended to visit our manufacturing plant at 17th and Cambria Sts.,—North Philadelphia—the home of the famous Keystone line of Railway, Power and Industrial Electrical Equipment.



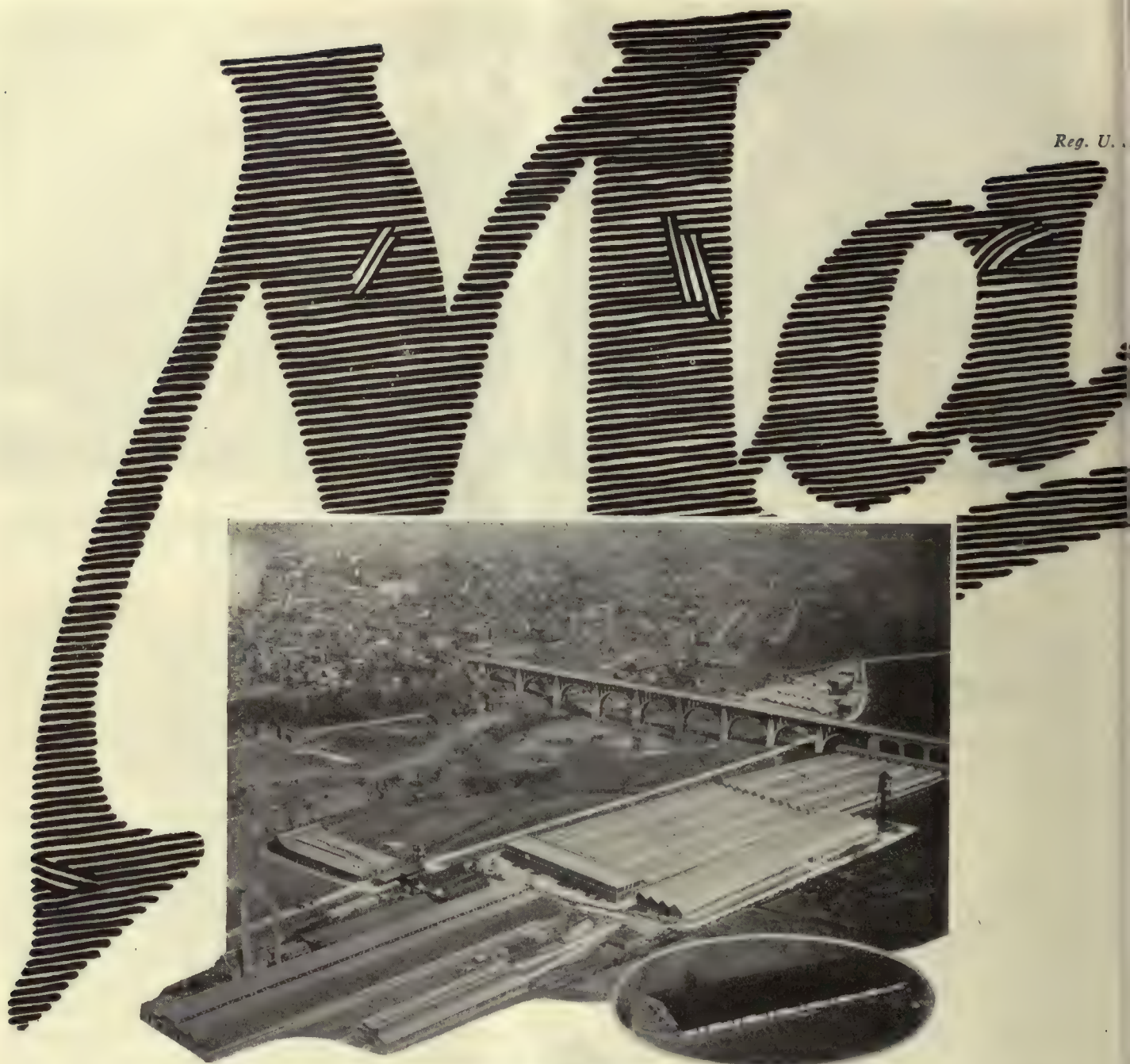
ELECTRIC SERVICE SUPPLIES CO.

PHILADELPHIA
17th and Cambria Sts.
PITTSBURGH
1123 Bessemer Building

NEW YORK
50 Church St.
BOSTON
88 Broad St.
Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

CHICAGO
Illinois Merchants' Bank Bldg.
DETROIT
General Motors Bldg.

Reg. U. S. Pat. & Tm. Off.



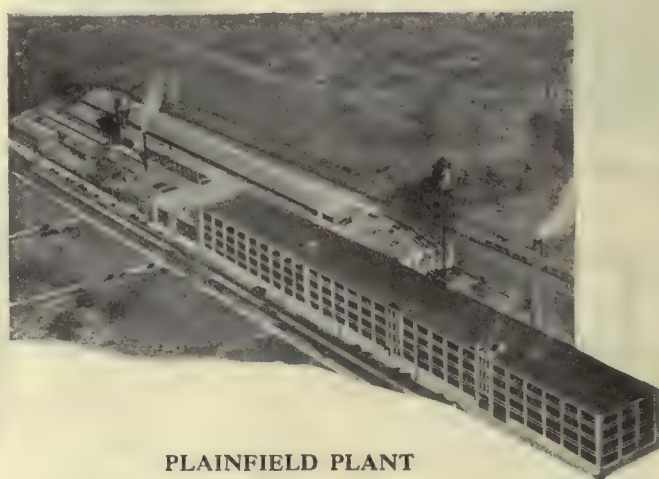
MACK ALLENTOWN PLANT

Ground Area, 132 Acres. Floor Space, 926,463 sq. ft.



NEW BRUNSWICK PLANT

Ground Area, 17 Acres
Floor Space, 486,260 Sq. ft.



PLAINFIELD PLANT

Ground Area, 8½ Acres.
Floor Space, 315,300 Sq. ft.

Mack-Made Buses

25-Passenger City Type
 29-Passenger City Type
 25-Passenger Parlor Car
 25-Passenger Suburban Type
 29-Passenger Suburban Type
 25-Passenger Gas-Electric
 29-Passenger Gas-Electric

What's behind
 the Bus you buy?

What an impartial observer saw at Allentown

At Allentown, Pa., the Impartial Observer viewed the third and largest Mack plant where the larger chassis parts are made, the chassis erected, tested, finished and shipped and where Mack bodies are built. His cursory inspection required 5 miles of walking, after which he said:

"No wonder Mack quality is superlative. Here is bus manufacture on a stupendous scale, conducted in enormous buildings, each planned and built for a specific purpose, each shop flooded with daylight and equipped with machines whose fineness and efficiency is worthy of the super-materials used in Macks.

"In the enormous machine shop, the great frame, sheet-metal, wood-working and assembly shops, precision, cleanliness and ceaseless inspection proceed in line with the latest thoughts on straight-line production straight to the long erection floor.

"As with the exhaustive tests of gear parts at New Brunswick and the astonishing double test of engines at Plainfield, the tests at Allentown from rough forgings to finished chassis dynamometers permit nothing to be taken for granted.

"Having seen the ideal conditions under which Mack buses are finished, I no longer marvel at their thoroughgoing and lasting good looks.

"Why, Mack manufacture is a gigantic enterprise. Just one department, the bus body plant, is the largest of its kind in the world. The Mack is truly a completely manufactured, thoroughly standardized product of surpassing quality."

Mack cordially invites you to inspect its great factories and gain first-hand knowledge of how the Mack is built. If you cannot make this inspection, the direct Mack Factory Branch nearest you will gladly show you the finished product.

MACK TRUCKS, INC.
 INTERNATIONAL MOTOR COMPANY
 25 Broadway, New York City

One hundred and seven direct MACK factory branches operate under the titles of: "MACK MOTOR TRUCK COMPANY," "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION," and "MACK TRUCKS OF CANADA, LTD."

The **Mack** Bus

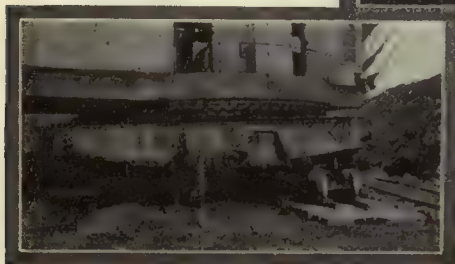


Pat. Off.



No. 4—3-conductor Super Service Cable—carrying 7500 volts to the big Marion Shovel, twenty-four hours a day.

No. 10—3-conductor Super Service Cord is used on this churn drill which precedes the shovel in its operations.



After almost a year of 24-hour days they report—"exceptionally good service"

At the Sunlight Coal Co.'s operation, in Indiana, Super Service Cords and Cables have been in service for almost a year.

The cable, carrying power to the big electric shovel, is dragged its full length over rocks and through mud every two or three days.

The cord that supplies the churn drill is hauled about from one position to the next through mud, muck and water.

Both the cord and the cable are exposed

to the weather at all times. Yet, in spite of this, Mr. F. B. Janeway, electrical engineer in charge, reports that Super Service "has given exceptionally good service."

The answer lies in the fact that every foot of Super Service is vulcanized in steel molds under tons of pressure. A patented process that gives perfectly centered conductors and an outside jacket that is water proof and tough enough to withstand the daily abuse of work under the worst conditions.

ROME WIRE COMPANY

Mills and Executive Office: ROME, N. Y.
Diamond Branch: BUFFALO, N. Y.

New York
50 Church Street
Boston
Little Building
Chicago
14 E. Jackson Blvd.
Detroit
25 Parsons Street

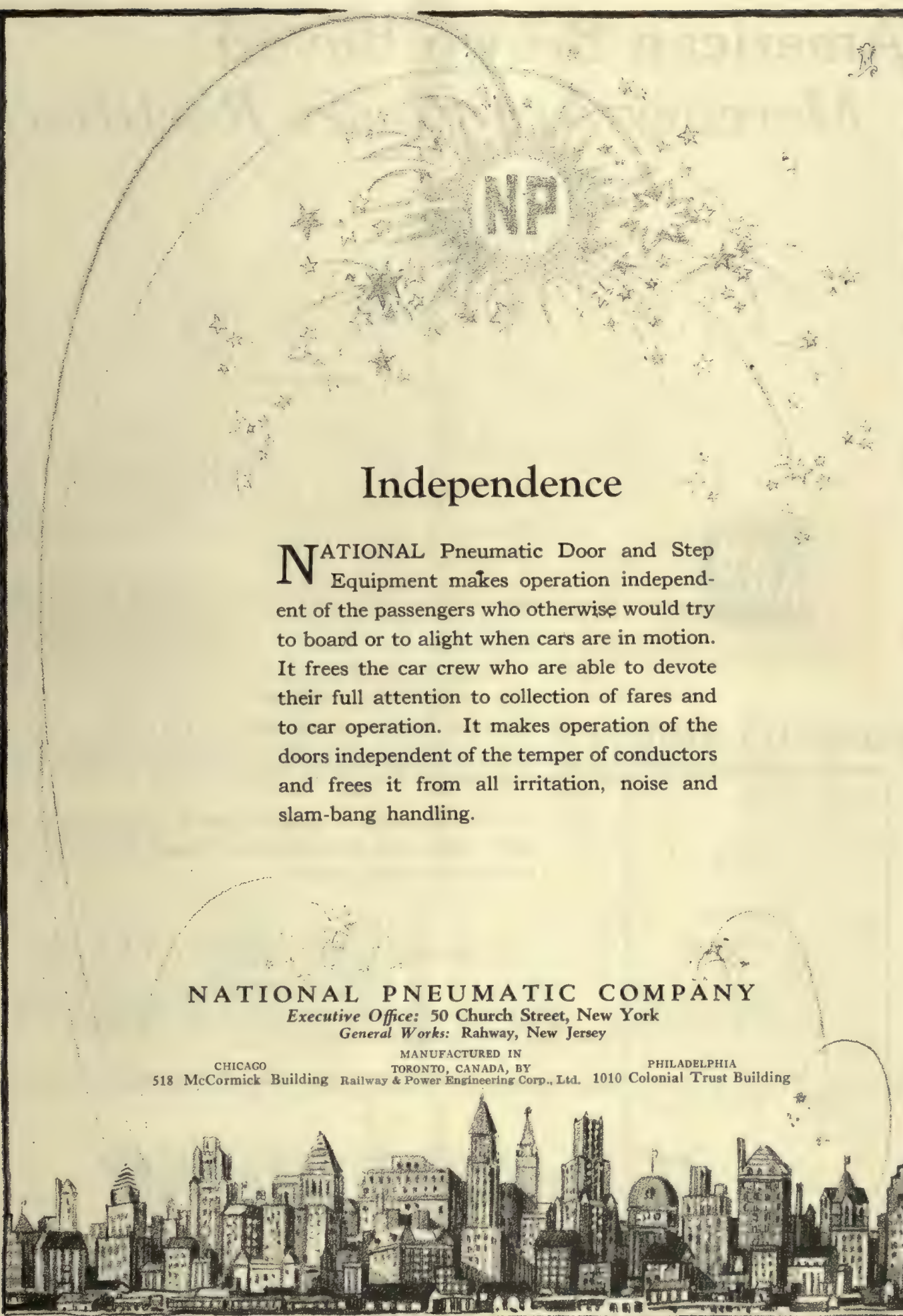
SUPER SERVICE

CORDS and CABLES

Cleveland
1200 West 9th Street
Los Angeles
J. G. Pomeroy, Inc.
336 Azusa St.
San Francisco
J. G. Pomeroy, Inc.
51 Federal Street

2587

A ROME WIRE PRODUCT



Independence

NATIONAL Pneumatic Door and Step Equipment makes operation independent of the passengers who otherwise would try to board or to alight when cars are in motion. It frees the car crew who are able to devote their full attention to collection of fares and to car operation. It makes operation of the doors independent of the temper of conductors and frees it from all irritation, noise and slam-bang handling.

NATIONAL PNEUMATIC COMPANY

Executive Office: 50 Church Street, New York

General Works: Rahway, New Jersey

CHICAGO

518 McCormick Building

MANUFACTURED IN

TORONTO, CANADA, BY

PHILADELPHIA

Railway & Power Engineering Corp., Ltd. 1010 Colonial Trust Building



American Brown Boveri Mercury-Arc Power Rectifiers

***answer:—**

WIDELY used in Europe for a number of years, Mercury-Arc Power Rectifiers have found their most popular application in the electric railway field. Their ability to effectively handle the fluctuations in load on railway lines without material loss in efficiency, from no-load, to high overload, is proved. There is no inertia of heavy rotating parts to be overcome.

On the accompanying charts are curves showing the comparative efficiencies and the average converting losses of Rotary Converters and Mercury-Arc Rectifiers for 600 Volts D.C. These data refer to an actual load curve of an interurban railroad. Note the great advantage of the Mercury-Arc Rectifier at one-quarter load, an ordinary condition on traction lines in non-rush hours; an idea of which can be gained by comparing the all day converter efficiencies and the converting losses.

Other advantages of the Mercury-Arc Power Rectifier are:— absolutely quiet operation, no moving parts except small auxiliaries, adaptable to full automatic operation, minimum maintenance required.

Further details of the principles, construction and operating features of this equipment will be given in subsequent advertisements.

Brown Boveri engineers have developed the Mercury-Arc Power Rectifier to a high degree of perfection in Europe. We are now in the act of building and installing this type of equipment in America.

****To the question— What points of difference are there between Mercury-Arc Power Rectifiers and other conversion units?***

**American Brown Boveri Electric
Corporation**

165 Broadway, N. Y. C.

. . . .

Camden, N. J.



PRINCIPAL PRODUCTS

*Electric Locomotives
for any system of current, high or
low tensions*
*Complete Equipment
for railway electrification*
*Mercury-Arc Power Rectifiers
(steel enclosed)*
Diesel-Electric Locomotives
Mining Locomotives
Motors (all sizes and types)
Rotary Converters
Motor Generators
Transformers (power or current)
*Switches, Controllers
and all Auxiliary Equipment*
Oil Switches
Condensers and Auxiliaries
*Steam Turbo Generators
for normal or high pressures and
superheats*
Automatic Regulators
Relays
Turbo Compressors and Blowers
Electric Furnaces
Induction Regulators
Ships
Diesel Driven
Turbine Driven
Electrically Driven
Structural Steel Fabrication

AMERICAN

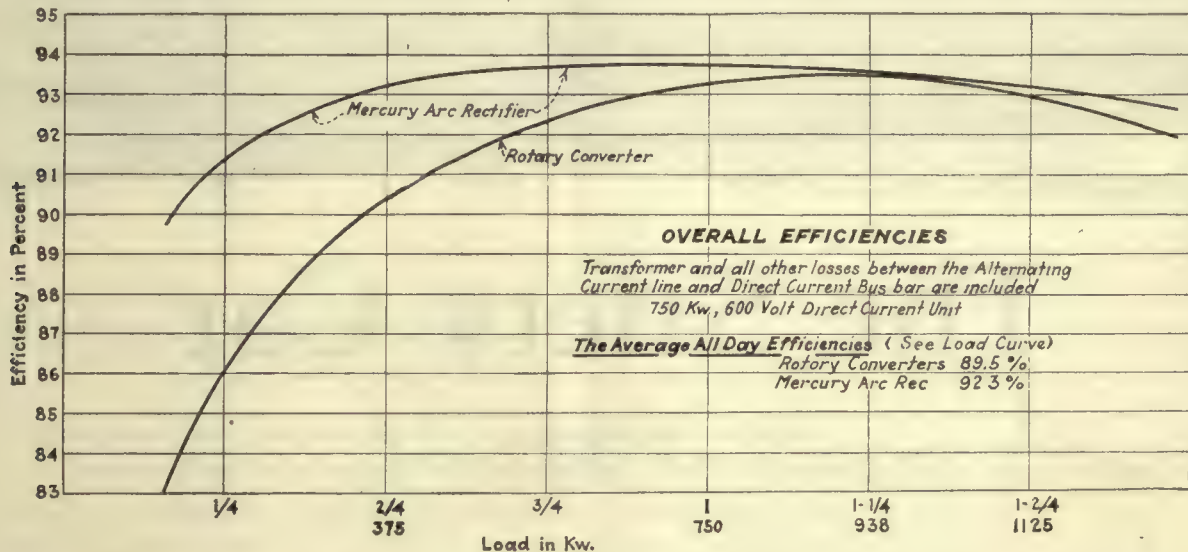
Efficient at all loads

With a BROWN BOVERI MERCURY-ARC RECTIFIER, characterized by unusually high efficiency at partial loads, the Average Converting Losses are, at extremely Low Load Factor, cut down tremendously, even at Rail Voltages as low as 600 V. Below is shown what can be done in an Actual Case by the use of Mercury-Arc Rectifiers. The reference is to an Interurban Railroad in one of the Eastern States. The substation rating is

750-Kw.-H., 600 V. The part of a record roll reproduced on this page shows the usual output over a period of six hours.

The AVERAGE ALL DAY OVERALL EFFICIENCY was found to be:

for Rotary Converters..... 89.5%
for Mercury-Arc Rectifiers..... 92.3%

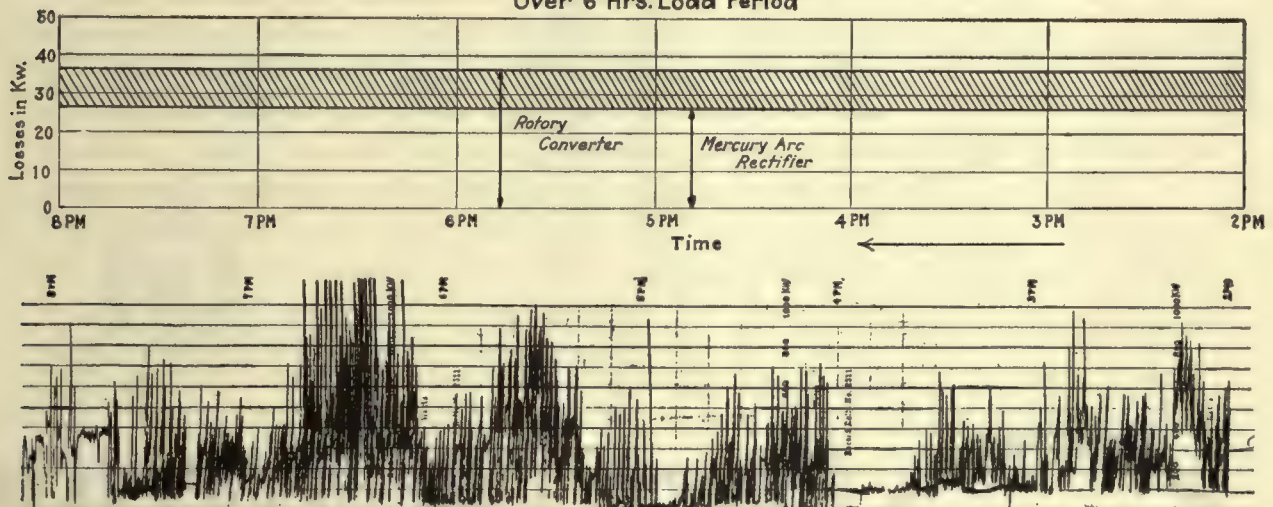


The saving obtained in six hours (represented by the shaded area) when extended over a 20-hr. day, amounts to MORE THAN 200 KW.-H., or, at 1c. per Kw.-H., THE ANNUAL SAVING effected is \$730.00, which is

the INTEREST on MORE THAN \$10,000.00.

In addition to the power saving, the maintenance cost will be less than half as much as with rotary converters.

Comparative Average Converting Losses in Kw.
Over 6 Hrs. Load Period



BROWN BOVERI



The Safety Car

—is an exemplification of modern safety and economy in street railway equipment. It bridges the gap between ordinary precaution and positive safety, stimulating public appreciation through the medium of safe, adequate, accelerated service that follows with the obvious economic advantages of Safety Car installation.

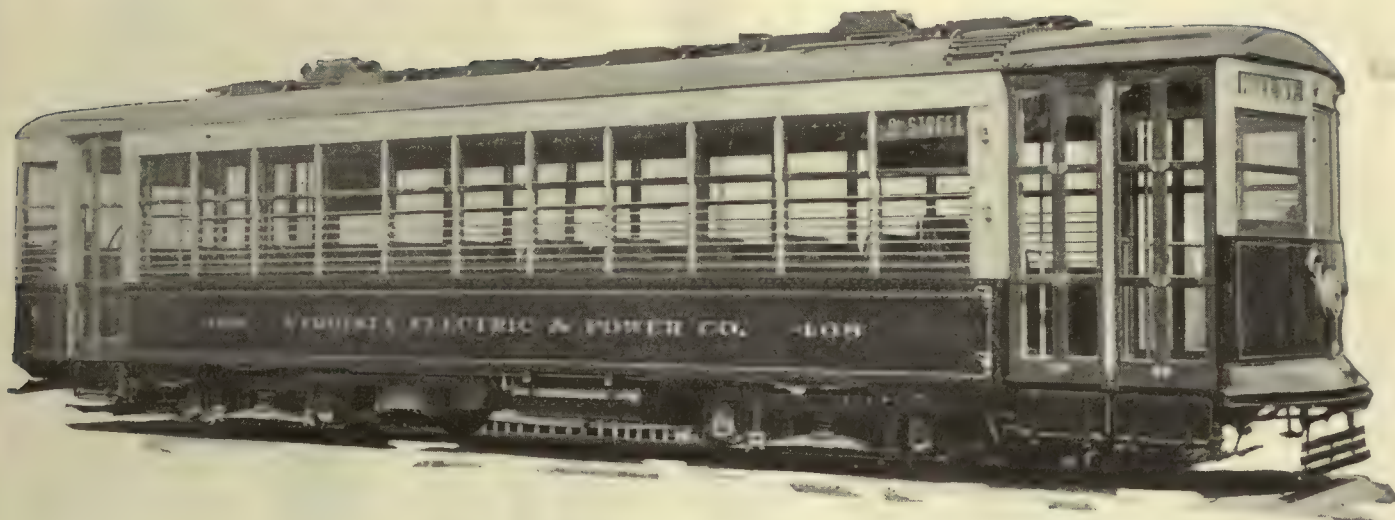
Safety Car Control Equipment interlocks the power, brake and door control functions to combine ease and convenience of operation with positive safety. Greater convenience is realized because both brakes and doors are controlled by the manipulation of a single operating handle, and because selective door control is possible. Greater safety is assured because careless or promiscuous door opening is prevented, the car must be stopped before the doors can be operated, the doors must be closed before the car can be started, and release of the controller handle, through motorman's negligence or disability, cuts off the power and applies the brakes automatically.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.

Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH



A new user of Variable Load Brakes

The *Virginia Railway and Power Company* has recently put into service 15 new cars equipped with Westinghouse Variable Load Brakes.

This is one of the many traction companies that have recognized the auspicious part that Variable Load Brakes can play in the operation of modern light weight surface cars.

Variable Load Brakes provide for the same effectiveness of retardation throughout the entire range of car loading, thus assuring uniformly short stops which are reflected in greater safety and increased schedule speeds.

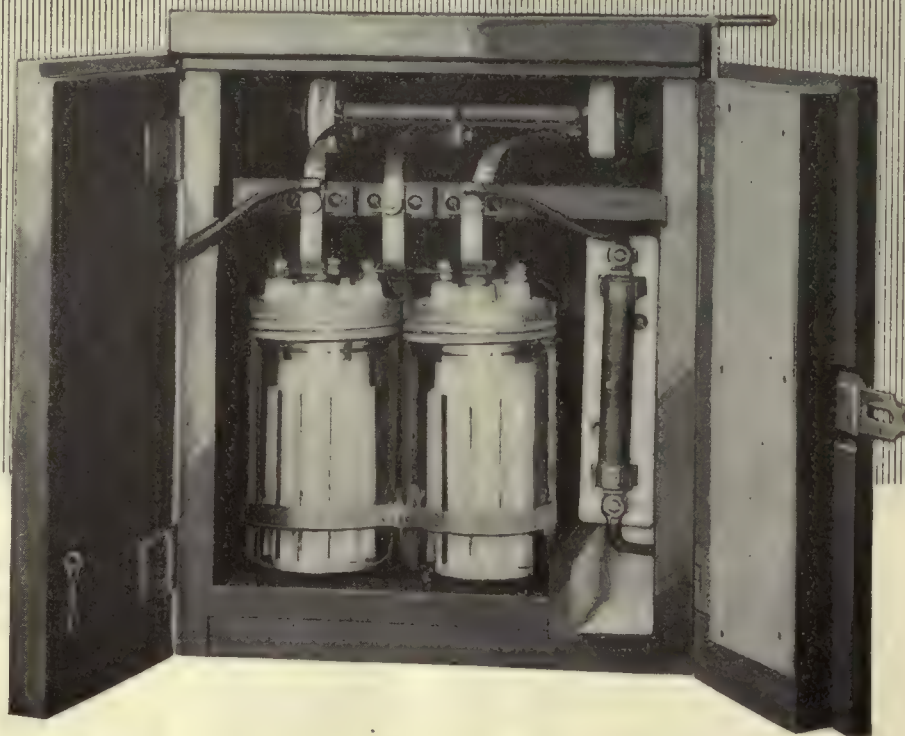


Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office—Ask for Descriptive Catalogue T-2045.

WESTINGHOUSE TRACTION BRAKE CO.

General Office and Works: WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES



Worthy of modern cars

The installation of D-C. Aluminum Arresters is right in line with the adoption of modern cars to reduce operating costs, because the record of this railway arrester in furnishing lightning protection is a record of cars kept out of the shop.

It is significant that south of the Mason-Dixon Line, where lightning storms are the most numerous, practically every electric railway has its equipment protected with arresters of this type.

The absolute protection afforded by the D-C. Aluminum Arrester is attested by roads where, with hundreds installed, not a single armature failure caused by lightning is experienced for years at a time.

No wonder that the confidence in this arrester is so enduring!



The D-C. Aluminum Arrester built by General Electric has the advantage of the most advanced facilities for research in lightning phenomena. It has the advantage of G-E experience with arresters for all other classes of service. It is the superlative arrester for the protection of car equipment.

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 68

New York, Saturday, July 3, 1926

Number 1

Drifting Along the Path of Least Resistance

RESULTS just obtained in a survey of car purchases for the first six months of the year and published in this issue demand careful consideration by all electric railway men. A most serious condition is divulged by these figures. To say that some mighty straight thinking is required by the industry is putting the situation mildly. There have been a total of 802 cars purchased for the half year and at present there seems to be little prospect of exceeding this number during the next six months. At this rate there would be a total of 1,600 cars purchased for the year. This is approximately the number purchased during 1925, the lowest for several years.

A moment's consideration shows where this rate of car purchases is leading the industry. Assuming that all cars bought are for replacements and not for additional facilities, it would take at least 45 years to renew the cars now in service. Of these 25,000 are now more than twenty years old. Some are even much older. It requires no prophetic power to anticipate what will happen to the industry long before its cars are permitted to get into any such condition as is indicated by these figures.

What are railway men going to do about it? At present they are permitting the equipment on which they are dependent for attracting patronage rapidly to get into a more and more disreputable condition. Street cars cannot run forever, and any attempt to dodge the facts is suicidal. If the present neglect of car replacement is not corrected the public apathy toward any service which presents a down-at-the-heels appearance will lead not only to complete public indifference to tax, fare and franchise problems, but will ultimately result in active demand for abolition of such service as a nuisance.

What matters it that electric railways continue to be the most economical method of public transportation? The American public will not tolerate any service that seems out of date, regardless of its economy, nor will it listen long to appeals for remedial measures for the preservation of a service that has become unpopular. True, money for new cars is scarce and hard to get, but fortunately, it has been adequately demonstrated that on most properties new equipment literally pays for itself through operating economies alone. Manufacturers stand ready to arrange equipment trusts. Savings that can be made in the cost of new cars, particularly on the smaller properties, by adherence to some uniformity in type and size, would probably more than compensate for the necessary banking discount for such financing.

New cars are not a panacea. They will not take the place of good management, but they are a part of good management. They may be made the basis for bringing about many needed measures for relief from franchise restrictions, inadequate fares and other burdens.

Even a comparatively small number of up-to-date, attractive new cars on a hard-pressed property may be made the means of bringing home to the public the character of improvements that would result from relief measures sought by the railway. Such a procedure may be characterized as "selling" the idea of relief to the public by offering something attractive as an inducement.

The industry is today faced in the wrong direction on this car situation. It is high time to forget the fallacious idea that people will ride in any old vehicle that gets them to their destination. It is a grave mistake to drift along the path of least resistance because improvement is difficult. There is a strong current of progress in transportation, and the agency which drifts is sure to be headed down stream.

Chicago Sets a New World's Record

NEITHER the story nor the pictures presented elsewhere in this issue tell all there is about the transportation feat that was performed at Chicago in handling the Eucharistic Congress crowds. This does not mean that either the story or the pictures are inadequate. It is a stimulating account of accomplishment and the pictures tend to round it out, but like all similar accounts the reader must put something into it if he would get something out of it. The figure of 5,087,481 passengers carried by the Chicago Surface Lines in one day, a number 650,000 in excess of the corresponding day a year ago, reduces the feat to mathematical proportions, but it does not give a real idea of the problems involved. That would be well nigh as insuperable as was the feat itself. Similarly the fact that the North Shore and the Rapid Transit Lines delivered 130,000 at the gates of the seminary six hours after the migration began, stupendous as are the figures, also tells only part of the whole story. Consult the picture of the crowd milling around the Wabash Avenue station! This and the other pictures merely illuminate the subject with flashes that show the problem and the extent to which they went to cope with the situation.

Motor highways were reserved for the use of travelers to Mundelein, but despite this only an inconsequential number relied on their private cars to reach the site of the conclave. That in itself was a great tribute to the consciousness of the ability of the railroads to perform satisfactorily.

Out of the experience at Chicago many lessons will come. Not the least by any means of those already learned is that the rigid ban placed on parking in all streets in the Loop district for three days speeded up traffic to such an extent that a resolution has already been introduced into the Council to make the no-parking rule for the downtown district permanent.

It is a valuable story of measures and men, this one

of handling the Chicago crowds. Either would have been ineffective without the other. If in the account elsewhere in this issue the efforts of the men appear to be submerged, that is only because, after all, their performances were largely personal, individual. A very significant testimonial to them is that there were no man failures, no casualties. All in all, it is a record of a stupendous undertaking successfully completed. Managements and men deserve great credit.

Transit Congestion May Force Stricter Height Limitation in New York

COMPARING the present appearance of Manhattan Island to a railroad baggage room on the day after Labor Day, strewn about with up-ended trunks and boxes, Henry H. Curran, a member of Mayor Walker's recently-formed committee on city planning and survey, urged an immediate ban against skyscrapers. He suggested a building limit of six stories on side streets and ten stories on avenues. Construction of high buildings has outrun the ability to provide adequate rapid transit, he pointed out. The more subways are dug the more skyscrapers are built to utilize the added capacity, and the perennial straphanger remains the symbol of metropolitan transportation conditions.

Gradually the idea is spreading that relief from congestion is not to be had simply by building more and more transit lines. It takes only a simple calculation to show that the ultimate demand for transportation, if the entire business district were built up to the limit allowed by law, would be far in excess of the ultimate capacity of all the rapid transit lines which it would be feasible to construct. The sooner this situation is understood the better it will be. If stricter height limitation must eventually be adopted, this should be done as quickly as possible. By this means a more even development of the entire metropolitan area will be encouraged. Neglected and dilapidated sections of the city will be restored to usefulness. The transportation system will broaden out, and the city will be healthier and better for the change.

Europe Has Faith in the Future of Rail Transportation

CONFIDENCE in the future of electric surface railway transportation is indicated by recent car purchases in foreign countries. In Great Britain the tramways have ordered nearly 700 new cars since the first of last year. Details were given in an article in this paper on June 26. Not long ago the street railways of Berlin, Germany, placed orders for 1,000 new cars. After extensive experimentation the Paris system decided a little more than a year ago to build 475 new tramcars. A long list might be given of other foreign street railways that have recently made substantial additions to rolling stock.

Particular significance attaches to these car purchases because they were made despite vociferous arguments of the bus proponents to the effect that the usefulness of the tramways was over and that buses should be bought rather than new cars. Careful study of conditions, however, convinced the various managements that the tramways were performing an essential service which would not satisfactorily be superseded by bus service.

Reasons given for retaining the tramways rather than substituting buses for them were substantially the

same in the different cities. Primarily, it was evident that transportation service could be rendered much more cheaply by tram than by bus, and, second, it was feared that the large number of buses which would be required to replace the cars would make worse the already serious traffic congestion. The difficulties resulting from the presence of an excessive number of buses in streets of London has given pause to some of the more enthusiastic bus adherents.

Ownership of the transportation system by the municipality itself in nearly all of the cities where new cars recently have been purchased assures the impartiality of the investigation of the relative merits of cars and buses. Questions of franchise rights, protection of security holders, etc., which have sometimes tended to obscure the issue and prevent its determination on the basis of merit alone, were largely absent. Moreover, many of these transportation systems have already undertaken bus operation on an extensive scale, and know from experience its advantages and disadvantages. The decision to continue and expand the tramway service is thoroughly in accord with the ideas of competent transportation men in the United States, and leads to the hope that the confusion which has existed concerning the proper spheres of the street car and bus is gradually being cleared.

Law on Use of Highways Rapidly in the Making

PRACTICALLY all courts, whether with state or federal jurisdiction, are now rapidly making precedents on legal questions relating to the use of the highways. The reason, of course, is the large number of motor vehicles desiring to use the roads, but particularly it is the great increase of trucks and buses, many of which are operated in competition with the older forms of common carriers. During the last few years there has been a great deal of legislation relating to motor carrier operation, and the courts have passed more explicitly than has ever been necessary in the past upon the fundamental rights and duties of all users of the highways.

One of the most interesting recent decisions is that of the United States Supreme Court, early in June, in the case of the Frost & Frost Trucking Company. Readers of this paper are familiar with the position taken by the California Legislature that it had the power to set the conditions under which the highways of the state can be used for commercial purposes. This position received the approval of the California Supreme Court, which upheld the State Public Service Commission when it refused a carrier under private contract right to operate in the state without first having secured from the commission a certificate of public convenience and necessity.

In one sense this position of the state has been approved in the United States Supreme Court decision just rendered, but in another way it has been upset. In disagreeing with the California view the Supreme Court says there are limits to the conditions which a state can impose on carriers. It cannot, for example, compel a private carrier to assume against his will the duties and burdens of a common carrier. More broadly speaking, it cannot offer to grant him a valuable privilege only if he will relinquish rights guaranteed to him under the federal Constitution. But the Supreme Court was very careful to add that it did not mean

to abate in any degree the power exercised by the state or of its utilities commission over common carriers or over those who to escape utility regulation posed as private carriers. In other words, it was the effort of the California law to change the status of the carrier from what it was to something it was not that came under the ban of the Supreme Court.

Outside of this decision, the most important recent development on the status of highway usage is probably the decision rendered by the Ohio Supreme Court within the last few weeks overruling an order of the State Public Utilities Commission which granted the Buckeye Special Transit Company of Columbus right to operate motor buses promiscuously over irregular routes within the state. Every such route, according to the court, must be advertised in the required way in each county to be traversed and the service must be one which will fulfill a demand for convenience and necessity. Some sixteen existing transportation companies in Ohio carried this case to the Ohio Supreme Court as appealing the decision of the commission.

In some respects this decision is like that of the California case, since in both there was an attempt to bring under the common carrier law a carrier that wanted to do a special business. The difference was that in California the carrier objected, while in Ohio the objection came from the railways and bus companies that would be subject to competition. But both cases show the increasing demand for various kinds of motor carrier service and the necessity in each state for some definite legislative program by which the activities of these carriers will come under proper regulation. This regulation ought to be such as will give the public the benefit of the expanding uses offered by motor buses and trucks without encroaching on what is really the entirely different service given by the established common carriers. Such a program can be begun none too soon.

It is unfortunate for this reason that the effort to provide some sort of adequate regulation for public interstate motor carriers seems destined to failure at the present session of Congress. The bill offered may not be ideal in every respect, yet admittedly some improvement over existing conditions is greatly needed. If nothing should be done at this session, steps should be taken promptly when Congress meets again.

Higher Standards the Real Goal at Which to Shoot

MUCH discussion always follows the suggestion that affiliated bus operations should be similar to rail operations in color of equipment, style of uniform and methods of performance. Equally as many opinions are voiced that it should be distinctive; that care should be taken to differentiate between the service details so that the people may know that here is something different and a step ahead in transportation.

It appears that there are grounds for both of these contentions, but the underlying reasons apparently do not often come to the surface. The basic consideration is that whatever is done should be an improvement in every sense of the word. The quality of transportation should be lifted and no attempt made to drag down the people's desires to the level of antiquated equipment.

If through the adoption of modernization programs in the past the rail system enjoys the support and good will of the public there is reason to have the bus sys-

tem emulate the electric cars in color, finish, method of operation, etc. In this way the bus will assume the rôle of an auxiliary service to be operated on the same high standards that have been previously established.

On the other hand, it may be a stroke of genius to establish an auxiliary bus service in a totally different manner and as far removed as possible from the rails. By doing this the onus of the old is not passed on to hamper the initial effect of the new agent. Further expansion of the bus and perhaps a revamping of the rail lines will thus be encouraged.

A Drive Against the Summer Fool Killer

SOMEHOW the glamor of the summer season is dimmed by accidents, especially week-end accidents. From Saturday noon to Monday morning throughout the summer season, with people pleasure bound and safety barriers let down, the accident record reaches its apogee. Far too often what might have been the culmination of a happy holiday is converted into a catastrophe. Even those who fortunately are not participants in the tragedies suffer the pangs of the ill-fated ones. These survivors no longer philosophize on "accidents will happen," but sorrowfully recount how the accident might have been averted.

Now that this carefree season is nigh again the necessity for practicing safety first measures becomes of paramount importance. Railway companies can well afford to follow the example of the United Railways, Baltimore, which has started a campaign for the reduction of week-end accidents. It will be a drive distinct and different from the continuous safety work carried on by the company, and by its concentration on the proverbial accident period will probably increase the interest in the general subject of safety. By means of car card advertisements and posters the railway is transmitting its purpose to the public, and at the same time soliciting their help. Special cards have been distributed to the company's agents—trainmen and bus operators—warning them of their responsibility in preventing accidents which mar happiness and wreck homes.

With a slogan of "no week-end accidents" the 1926 record of safety on electric railway properties could be even more impressive than that of 1925, a banner year in many cities for safety first. A glance at some recent accident reports is testimony of this. In Scranton, Pa., 30,000,000 people were carried by the railway lines in 1925 without a fatality or serious accident of any kind. The railway department of the Milwaukee Electric Railway & Light Company reports a reduction of 50 per cent in accidents of all kinds during 1925. The United Railways, St. Louis, reports a decrease in accidents of all kinds of 12.5 per cent over 1924. In Buffalo the number of accidents decreased 7.2 per cent in 1925 over 1924. In Los Angeles the Pacific Electric Railway reported a decrease of 16 per cent over the preceding year. In Baltimore the number of accidents decreased 31 per cent compared with 1919, when the safety department was organized. In Rhode Island there was a decrease of 8.38 per cent over the 1924 record. So was progress made during 1925 toward the safe handling of passengers, whether due to safety contests, councils or codes. Further tangible evidences can be expected when the week-end campaign is universally adopted. A drive of this kind would not mean a cessation of regular safety activity. Rather would it serve to intensify general safety enterprise.

Car Purchases Below Normal Rate

Survey for Past Six Months Shows a Total of Only 802 Cars of All Types Ordered—740 of These Are Passenger Cars—Little Present Indication of Improvement During Remainder of Year—Bus Purchases Approximate First-of-the-Year Predictions—Analysis of Car Types Is Included

COMplete figures for the first six months of 1926 indicate that 802 cars of all types have been ordered by the electric railway industry. Of these 740 were passenger cars and the remaining 62 were freight and service units. These figures were obtained from a survey of all the car builders in this country, backed up by a review of orders which have been published in this paper.

In an effort to obtain some idea of the number of orders which will be placed during the coming six months, representative electric railways were requested to state their probable purchases of rolling stock, both cars and buses. Replies were received from some 70 properties, comprising nearly all of the larger railways in the country and a number of the smaller ones.

Buses are contemplated in abundance, but there is uncertainty in the matter of street cars to be ordered. The manufacturers are fairly evenly divided, some taking the attitude that the coming months will herald the long-anticipated revival of activity in the acquisition of cars, while others are more conservative and wish to witness a few promising inquiries before committing themselves. One car builder states that a group of four companies is actively contemplating the acquisition of 335 cars within the next 90 days.

The largest prospective order for cars that has been

TABLE I—PASSENGER CARS ORDERED BY ELECTRIC RAILWAYS DURING SIX-MONTH PERIODS SINCE 1922

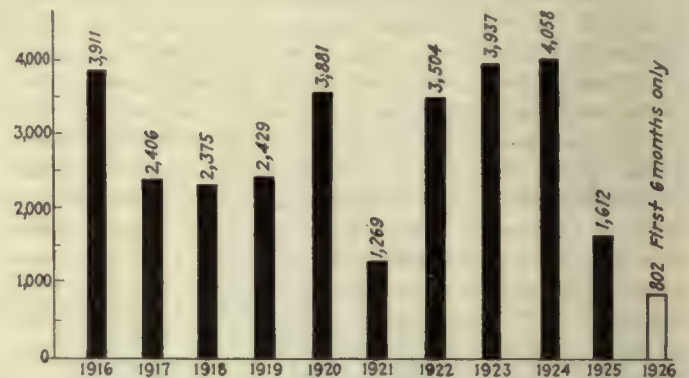
	Total	Per Cent
1923		
First six months	1,467	46
Second six months	1,708	54
Total	3,175	100
1924		
First six months	1,731	71
Second six months	699	29
Total	2,430	100
1925		
First six months	331	25
Second six months	933	75
Total	1,314	100
1926		
First six months	740	

announced to date is that of the Seattle Municipal Street Railway, Seattle, Wash. Bids have been requested for 80 cars with a closing date of July 30. Several purchases of additional rolling stock will be contingent on the outcome of public service commission hearings, negotiations with local authorities, etc., now in progress. Practically all cars which are definitely known to be in contemplation are of the double-truck, one-man, two-man type.

That it is difficult to predict the total purchases from the figures for the first six months is seen from Table I, showing a division for the last three years. In 1924 the first six months brought in 71 per cent of the orders, while last year 75 per cent were received the second half of the year. In 1923 the orders were quite evenly divided, 46 per cent being ordered in the first six months.

Two circular diagrams analyze the information con-

tained in Table II to show the types of cars which comprise the 802 ordered during the half year and further to split the city service cars into their various classifications. These diagrams bring out a number of interesting facts concerning trends in car design and the proportions of cars being purchased for city and interurban service. The fact that 75 per cent of the total cars ordered were for city passenger service is



Total Yearly Purchases of All Types of Cars by Electric Railways Since 1915

scarcely a matter for comment. This is about the average for the past six years, and reflects the relative amount of city and interurban business.

Only 35 freight cars were ordered during the six months, these being purchased by two of the companies which participated in the Central Electric Railway Association agreement to standardize freight trailer equipment. It will be remembered that a considerable number of these standard cars were ordered toward the close of 1925 by other members of the C.E.R.A. The further purchase of box and gondola cars is being contemplated by several roads for the current year.

Of the city cars 222, or 36 per cent, were of a type suitable for both one and two-man operation. Most of these were double-end, with double trucks and equipped with four motors. Next in favor were cars for straight two-man operation, these totaling 210, or 34 per cent of the whole. The third largest group was made up of double-truck cars for one-man operation, these also being generally equipped with four motors and of double-end construction.

At the bottom of the list appear the one-man single-truck cars. There were only 45 of these or approximately 7.5 per cent of the total orders. All but eight of these were greater than 28 ft. in length and therefore do not come under the general category of Birney cars. The double-truck car for one-man operation seems to be rapidly attaining the nature of a standard for this type of service, at least in current purchases.

SPECIAL CHARACTERISTICS OF CARS ORDERED

It has been quite noticeable in the cars ordered during the past few months that continually increasing emphasis is being placed on the matters of riding com-

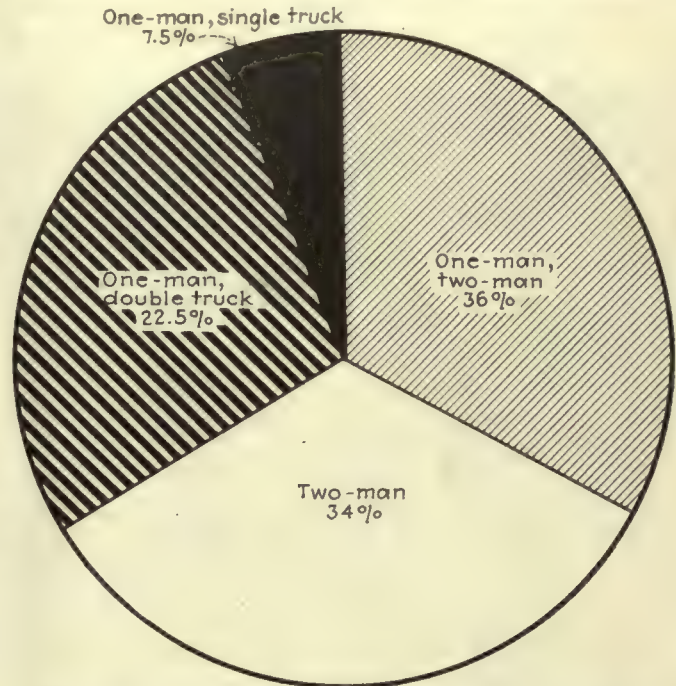
fort and esthetic appearance. Seats are undergoing a metamorphosis and the wood slats are giving way to spring cushions upholstered with plush, rattan and leather. In particular the frequency with which plush and leather are being specified indicates that these materials have met with marked approval from the railways and their customers. Upholsterings of leather and leather substitutes are perhaps somewhat in the lead over plush. Deep springs are much in evidence and there is a distinct tendency to use considerably lower seats than formerly. In fact, there have been several orders placed which called for seats 17 in. high.

Post and seat spacing varies from 28½ in. to 33 in. for city cars, and an average dimension of 29½ in. or 30 in. seems to be fairly common. This is another evidence that the railways are going more than half way in the effective marketing of transportation by catering to the comfort of their patrons.

Special floor coverings have been specified in a number of instances. Inlaid rubber tiling and linoleum are the materials which have principally been used for this purpose. Fewer cars are being built with wood slats on the floors than in past years. Practically all of the cars ordered were equipped with folding doors and steps and in many cases treadle mechanisms have been provided to operate rear or center doors for one-man service. On some interurban cars bucket type seats

Philadelphia Rapid Transit Company, no particularly large orders have been placed. Several roads have made their initial investment in bus equipment to supplement their railway service during the six-month period, and many others have made further additions to existing bus equipment.

More buses were ordered for city service than for



The Various Types of City Service Cars Are Here Graphically Analyzed in the Proportions Ordered

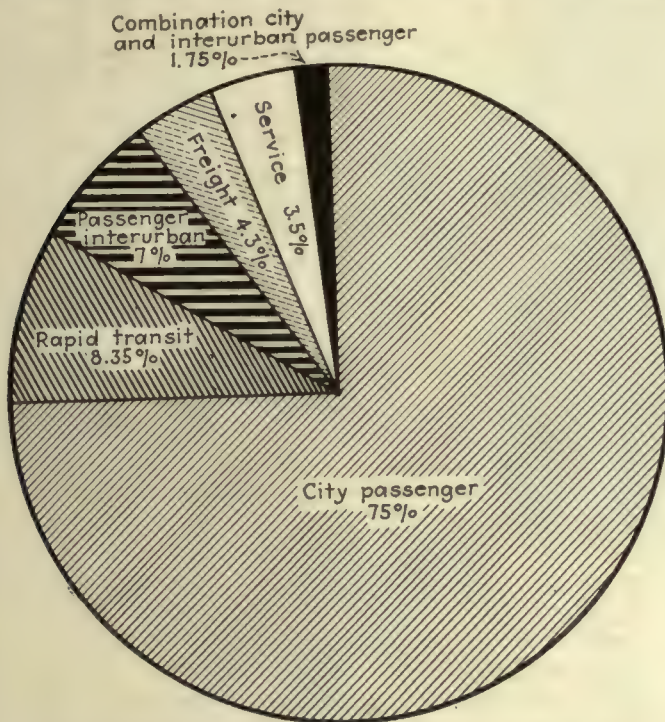


Diagram Showing the Proportion of Various Types of Cars Purchased During the First Half of the Year

have been specified, this being a deliberate bid to emulate the comfort and luxurious atmosphere attained in the modern parlor car bus.

BUS DEVELOPMENTS DURING THE PAST SIX MONTHS

Roughly estimated, the number of buses purchased by electric railways during the first half of the year was 1,000. Detailed purchases by companies have not been obtained, but material in the rolling stock columns of the JOURNAL and in reports received from the leading manufacturers indicate that this is a fairly representative figure.

With the exception of 135 buses bought by the Phila-

interurban routes. The tendency even in the street car type of bus has been to render service as attractive as possible by means of more luxurious equipment, increased knee room and better appearance, both exterior and interior. Practically all interurban and suburban equipment was of the de luxe parlor car type. Of some 175 double-deck buses ordered, 75 went to the Philadelphia Rural Transit Company and 50 to the Department of Street Railways, Detroit, Mich. In the single-deck equipment 25 and 29-passenger capacities predominated, although many railways indicated that for their particular services the 21-passenger bus was more adaptable. The gas-electric type of equipment continues to arouse interest among railway bus operators. The Philadelphia Rural Transit Company, a bus subsidiary of the Philadelphia Rapid Transit Company, has standardized its entire equipment on the gas-electric basis, including the 135 buses it ordered. Two other large orders for gas-electric equipment were those of the Department of Street Railways of Detroit for 50 and the Public Service Company of Newark, N. J., for 54 buses.

For the most part bus manufacturers are decidedly optimistic in their predictions of business during the next six months. Doubling the figure of 1,000 buses for the first half of the year would not equal the 2,200 units purchased by electric railways last year. Plans for more complete co-ordination of bus and trolley service are being rapidly pushed forward by many companies, and the manufacturers appear to be justified in expecting an increase of business for the remainder of the year. At least one company is contemplating the purchase of more than 100 buses, provided that certain features of the local transportation situation are satisfactorily worked out. Numerous inquiries for buses

in lots of from 10 to 25 have been received by several of the manufacturers. The predictions of the manufacturers taken in connection with the purchases estimated by the railways seem to indicate that approxi-

mately 1,500 buses will be ordered by them from July to the end of the year. This will bring the total for the twelve months to approximately 2,500, a considerable advance over 1925.

Table II—Details of Rolling Stock Ordered During First Six Months of 1926

	No.	Class	Service	Motor or Trailer	Single or Double Truck	Length, Ft. In.	Width, Ft. In.	Weight, Lb.	Motors	Seats	One or Two Man	Center or End Entrance
Alabama												
Birmingham Electric Co.	16	Passenger	City	Motor	Double	49— 7	8— 0	35,000	4	62	Both	Center
Mobile Light & Railroad Co.	5	Passenger	City	Motor	Single	29— 9			2	32	One	End
Arkansas												
Arkansas Central Power Co.	30	Passenger	City	Motor	Single	28— 6½			2	33	One	End*
Forth Smith Light & Traction Co.	6	Passenger	City & Int.	Motor	Single	28— ½	8— 0	16,000	2	32	One	End*
California												
Key System Transit Co.	6	Dump	Construct	Motor	Double	40— 0						
Key System Transit Co.	4	Dump	Construct	Trailer	Double	40— 0						
Connecticut												
Connecticut Co.	1	Crane	Construct	Motor	Double	42— 0						
District of Columbia												
Washington Railway & Electric Co.	15	Passenger	City	Motor	Double	42— 3				49	One	
Florida												
City of St. Petersburg	8	Passenger	City	Motor	Double	40— 1			4	44	One	End
Georgia												
Georgia Railway & Power Co.	5	Passenger	Interurban	Motor	Double	45— 6	8— 4	36,245	4	51	One	End*
Georgia Railway & Power Co.	5	Passenger	City	Motor	Double	46— 4	8— 4	37,380	4	48	One	End
Georgia Railway & Power Co.	60	Passenger	City	Motor	Double	46— 4	8— 3	37,000	4	48	One	End
Illinois												
Aurora, Elgin & Fox River Electric Co.	8	Passenger	Interurban	Motor	Single	28— 0	7— 9½	18,050	2	32	One	End
Chicago & Joliet Electric Railway	10	Passenger	Interurban	Motor	Double	46— 2	8— 10½	38,000	4	52	One	End
Chicago Surface Lines	34	Passenger	City	Motor	Double	48— 11		41,000	2		Both	
Chicago Surface Lines	33	Passenger	City	Motor	Double	48— 11		41,000	2		Both	
Chicago Surface Lines	33	Passenger	City	Motor	Double	48— 11		41,000	2		Both	
Indiana												
Gary Railways	5	Passenger	City	Motor	Double	45— 0		37,000	4	46	One	End
Southern Indiana Gas & Electric Co.	13	Passenger	City	Motor	Double	37— 6			4		One	End*
Maryland												
Potomac Edison Co.	2	Passenger	City	Motor	Double	40— 0			4	38	Both	
Massachusetts												
Berkshire Street Railway	10	Passenger	Interurban	Motor	Double	40— 0			4			
Boston Elevated Railway	6	Work	Construct	Motor	Double	40— 0						
Boston Elevated Railway	75	Passenger	City	Motor	Double	46— 7½	8— 7½		2	44	Two	
Boston Elevated Railway	25	Passenger	City	Motor	Double	46— 7½	8— 7½		2	44	Two	
East Taunton Street Railway	2	Passenger	City	Motor	Double	36— 10	8— 1	27,934	4	44	Both	
Michigan												
Michigan Railroad	15	Freight	Interurban	Trailer	Double	49— 8	8— 5½					
Minnesota												
Twin City Rapid Transit Co.	1	Crane	Construct	Motor	Double							
New York												
Brooklyn City Railroad	1	Crane	Construct	Motor	Double	44— 0						
Brooklyn-Manhattan Transit Corp.	67	Passenger	City	Motor	Double						Train	
Jamestown Street Railway	8	Passenger	City	Motor	Single				2	30	One	
New York State Railways	1	Dump	Construct	Motor	Double	40— 0						
New York State Railways	1	Dump	Construct	Trailer	Double	40— 0						
Schenectady Railway	2	Dump	Construct	Motor	Double	40— 0						
Ohio												
Columbus, Delaware & Marion Electric Co.	2	Parlor	Interurban	Motor	Double	62— 0		102,000	4	35	Two	
Northern Ohio Traction & Light Co.	1	Dump	Construct	Trailer	Double	40— 0						
Penn-Ohio System	10	Freight	Interurban	Trailer	Double	49— 8	8— 5½					
Portsmouth Public Service Co.	3	Passenger	City	Motor	Double	42— 11	8— 6½	26,800	4	55	Both	
Steubenville, East Liverpool & Beaver Valley Traction Co.	8	Passenger	City & Int.	Motor	Double	48— 0		40,000	4	51	Both	
Stark Electric Railroad	8	Passenger	Interurban	Motor	Double	47— 0	8— 8½	32,500	4	52	Both	
Toledo Edison Co.	1	Dump	Construct	Trailer	Double	40— 0						
Western Ohio Railway	10	Freight	Interurban	Trailer	Double	49— 8	8— 5½					
Pennsylvania												
Pennsylvania Railroad	8	Passenger	Interurban	†	Double							End
Philadelphia Rapid Transit	50	Passenger	City	Motor	Double	45— 6	8— 6	36,940	4	48	Two	Center*
Pittsburgh Railways	50	Passenger	City	Motor	Double				4		Two	
Sunbury & Selinsgrove Railway	3	Passenger	Interurban	Motor	Double	40— 3			4	51	Both	Center
West Side Electric Street Railway	3	Passenger	City	Motor	Double	41— 2	8— 3	35,060	4	46	Both	End
Wilkes-Barre Railway	10	Passenger	City	Motor	Double	45— 0			4		Two	
Rhode Island												
United Electric Railways	10	Passenger	City	Motor	Double	41— 0				44	Both	
Tennessee												
Memphis Street Railway	32	Passenger	City	Motor	Double	46— 0			4		Both	*
Nashville Railway & Light Co.	10	Passenger	City	Motor	Double	40— 0			4		Both	
Nashville Railway & Light Co.	1	Work	Construct	Motor	Double	40— 0						
Tennessee Electric Power Co.	10	Passenger	City	Motor	Double	40— 0			4		One	End
Texas												
Dallas Railway	2	Dump	Construct	Motor	Double	40— 0						
Dallas Railway	30	Passenger	City	Motor	Double	45— 8½	8— 5		4		Both	
Vermont												
Springfield Terminal Railway	2	Pas. & bag.	Interurban	Motor	Double	41— 6				28	Two	End
Virginia												
Roanoke Railway & Electric Co.	6	Passenger	City	Motor	Double	41— 4				44	Both	
Purchaser not specified												
	19	Passenger	City	Motor	Double	42— 0			4	44	One	End*

* Single-end construction.

† Articulated three-car units.

‡ Motor-multiple unit.

Greatest Feat in Transportation History

All Records for Passenger Handling Believed to Have Been Broken by the Chicago Surface and Elevated Lines During the Mundelein Migration—Vivid Account of the Extreme Length to Which the Roads Went to Accommodate Prospective Passengers

IT WILL probably never be known just how many pilgrims journeyed to Chicago from all parts of the world last month to attend the 28th International Eucharistic Congress of the Catholic Church, but that the transportation agencies played a conspicuous part in the success of the elaborate program will never be gainsaid. So efficient was their functioning, in fact, that had it not been for the outdoor services and mammoth pageants, which drew anywhere from 150,000 to 300,000 persons to the downtown district every morning of the four-day conclave, the casual observer would have been wholly unaware that the city's population had suddenly been increased by more than one-third.

At no time during the great religious conference were there fewer than 600,000 delegates in Chicago, and from the time the spectacular ceremonies opened in Grant Park Stadium on June 20 to the celebration of the final mass at Mundelein on June 24, it is estimated that close to 1,000,000 visitors bent on acclaiming the Eucharist had been in the city—the greatest assemblage of people for a single event in the history of the world.

The task of transporting this vast throng from every corner of the city to the various sectional meetings and diurnal services in the downtown stadium taxed every available resource of the combined surface and rapid transit systems. In anticipation of the unprecedented travel, all painting and repair work on the equipment of both lines was suspended, and on the day the congress opened the surface lines and elevated system reported 99.8 per cent and 98 per cent of their respective equipment in service. Monday, June 22, was the biggest day in the history of the Surface Lines, more than 5,087,000 revenue passengers being carried. On the same day the Rapid Transit Company announced that 1,800 cars were in service—the greatest number ever moved at one time in the annals of the elevated organization. Not even during the memorable days of the Columbian Exposition in 1893 or at the time the Armistice was signed could officials recall an occasion when the transportation companies had been called upon to render such a mighty service. Most remarkable of all, however, was the fact that, in spite of the greatly multiplied load, the lines man-



A Typical Crowd Awaiting Its Turn at the North Shore Ticket Booths on Wabash Avenue, Chicago

aged to handle their regular patrons with a minimum of inconvenience and delay. Some retardation of service was, of course, inevitable, but Chicagoans were generally philosophical and little trouble was experienced.

If the problems of local transportation were momentous, still more colossal was the burden imposed on the electric railways when officials of the congress announced that the culminating exercises would be held at Saint Mary's-of-the-Lake Seminary in Mundelein, a tiny village 40 miles to the north of Chicago. To study the situation and perfect plans for the gigantic movement of pilgrims to this shrine, a transportation committee was appointed on which three steam railroads and the Chicago Rapid Transit Company and Chicago, North Shore & Milwaukee Railroad were represented. Many months before the pilgrimage was to take place this committee set about to divide up the city into districts co-extensive with the several church parishes in

which the great host was to be quartered. The expected rail traffic of 300,000 was allocated according to the facilities and accessibility of each railroad. From its downtown terminal, the Chicago & Northwestern Railroad was asked to carry as far as Lake Bluff a total of 60,000 visitors quartered in parishes adjacent to its right-of-way in the northern half of the city. At Lake Bluff the Mundelein branch of the North Shore Line was assigned this load for haulage direct to the seminary grounds. The Chicago, Milwaukee & St. Paul Railroad was charged with the responsibility of hauling another 30,000 passengers from a large area in the northwestern part of Chicago to Libertyville, 2 miles east of Mundelein. Pilgrims billeted in the west and south sides of the city were allotted to the Soo Line terminal at Forest Park on the outskirts of Chicago. It was decided that by pressing every available car into service this last road might transport a possible 15,000 direct to Mundelein. The maximum capacity of the three steam lines was thus placed at 105,000.

In the belief that much of the travel to Mundelein would be by motor nine state highways, with a capacity of 1,000 cars per hour each in one-way traffic, were designated as official routes and barricaded at every intersection to prevent interference with the steady flow of vehicles. Each of these main arteries led directly to a parking space of 100 acres each a short distance away from the seminary grounds. On the basis of four passengers to each car, it was estimated that in eight hours of travel a possible 350,000 might reach Mundelein by automobile. That this number proved to be far in excess of the bare 75,000 or 80,000 who actually motored to the Catholic seat on June 24, however, could in no way be attributed to faulty planning or to precautions neglected. The great mass of pilgrims simply found it easier and more convenient to use rail service.

Because of their matchless facilities, convenience of connection and direct route, by far the heaviest share of the traffic by rail necessarily fell to the Chicago Rapid Transit and the Chicago, North Shore & Milwaukee Railroad. By concentrating all equipment in the movement, it was estimated that the electric roads could jointly carry 175,000 from the south, central and northeast parts of Chicago. In addition, the committee asked accommodations for the 60,000 transfer passengers from the Northwestern steam line at Lake Bluff and for the thousands of others who were expected to be attracted to the Mundelein ceremonies from North Shore suburbs and Wisconsin cities served by the Milwaukee division of the North Shore Line. As a result

of this allotment, the electric lines faced the overwhelming prospect of transporting 250,000 delegates, virtually two and one-half times the aggregate load of the three steam roads and nearly 60 per cent of the total migration. It was probably the greatest problem that has ever confronted any transportation system on earth, exceeding even the task of the steam railroads in Great Britain at the time of the exposition at Wembley.

The Rapid Transit Company was enabled to operate its own cars in local service to the downtown districts, take on passengers there for Mundelein and transport them direct to the seminary over the tracks of the North Shore Line without transfer.

Anticipating the day when its facilities would be put to this severest of tests, the North Shore Line hastened to complete its new Skokie Valley route begun in June, 1925. Without this high-speed air line with its heavy roadbed and minimum of grade crossings the movement of such a large percentage of the traffic to Mundelein would have been seriously hampered, if not altogether prohibited.

But the staggering problem was practically solved long before the influx of churchmen began. Preparations for their travel to Mundelein were on a vast scale. Rapid Transit and North Shore officials offered every assistance possible to Eucharistic representa-

tives to insure the success of the climax day of the congress. No trouble or expense for the comfort and convenience of delegates to the magnificent festival was spared.

Out in the fields which surround the little North Shore Line station of St. Mary's-of-the-Lake six special sidings with a capacity of 52 cars at one time were constructed. Alongside, five loading platforms were built, two of them 335 ft. long and 16 ft. wide and three 420 ft. long by 24 ft. wide. By this arrangement, it was possible for eight trains of six and eight cars each to be loaded or unloaded at the same time. An overhead control bridge, spanning the network of tracks, was also erected to insure speedy and efficient operation of trains in and out of the temporary terminal. At the head of each platform a loading chute with a comfortable capacity of 1,000 persons was built. Entrance into these chutes was from an enormous stockade completely encircled by a high picket fence. It was planned to admit only from eighteen to twenty trainloads, or roughly 9,000 people, into the stockade at one time in order to forestall the chaos which would naturally result if the surging thousands all attempted to "catch the first train back to town."

THE Chicago Surface Lines carried the greatest transportation load in its history on Tuesday and next to the greatest load on Monday, and did it without undue crowding or congestion. The Tuesday load reached a total of 5,087,481 rides on the system, an increase of 665,000 over the corresponding Tuesday of the year before.

Sunday, with 3,443,904 rides, was the biggest Sunday in the company's history. On Monday there were 4,993,000 rides. The rides on Wednesday totaled approximately the same as on Monday.

Practically every car on the system was available for service. Vice-President Richardson said that the millions of street car riders benefited materially from the elimination of parking in the downtown district, and that this, together with the very efficient co-operation on the part of the Police Department, made possible a freer movement of cars than under ordinary conditions. There was no confusion of traffic and there were no accidents during the three days.



One of the Six Loading Chutes at Mundelein Terminal. A Train from Chicago Is Seen Unloading 600 Passengers into Adjacent Chute. Returning Crowds Awaiting Chance to Board Train for Chicago

At Lake Bluff, 8 miles east of Mundelein, where the Chicago & Northwestern Railroad, the Milwaukee division of the North Shore Line and the Mundelein branch of the latter converge, two enormous loading platforms close to 400 ft. in length were installed to provide for the speedy transfer of steam road and shore line passengers to the thirteen eight-car trains of the North Shore Line that were operated in shuttle service at three-minute intervals to Mundelein.

In the shops of the Chicago Rapid Transit Company scores of cars were equipped with trolleys that previously were able to operate only over the third rail divisions of the elevated lines. A large number of trail cars were also equipped with motors.

EVEN DINING FACILITIES WERE PROVIDED

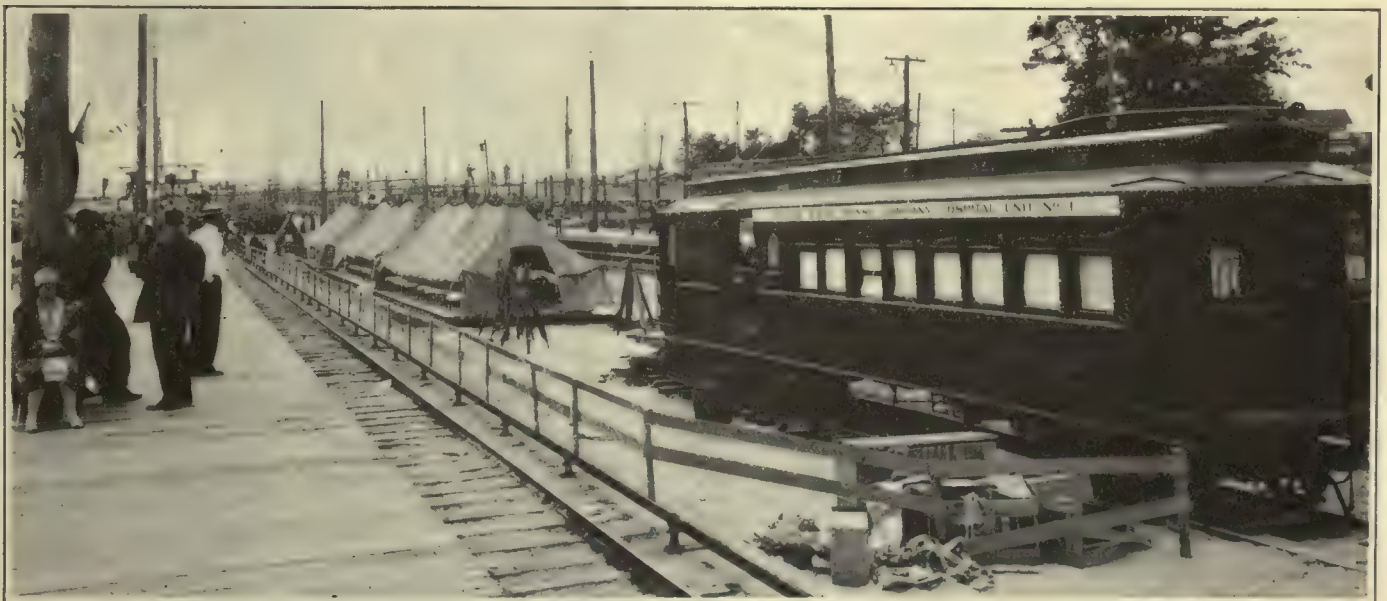
Expanded operating facilities, however, were not the only preparations made. To help feed the army of hungry pilgrims, the North Shore Line invested a large sum in the erection of a lunch stand with some 700 ft. of serving space. The kitchen forces for this concession alone numbered over 300. To remove the possibility of a sudden rush for the trains at the conclusion of the day's program and to facilitate the orderly loading of trains, the company also arranged a series of band concerts and motion pictures. The total cost

to the North Shore and Rapid Transit Lines for this single day's traffic in temporary platforms, tracks and other facilities is believed to have been in excess of \$150,000. Although this section is becoming increasingly popular among suburban home seekers, it will be many years before an actual need for these enlarged facilities will arise and their only value to the company at present is the salvage which can be made of them.

RAILROADS FURNISHED HOSPITAL FACILITIES

Further illustration of the splendid support which was given church officials by the Rapid Transit and North Shore management may be seen in the extensive arrangements made by the two roads for the care of persons requiring medical aid while attending the fête at Mundelein. Two hospital centers, each consisting of a fully equipped hospital car; three hospital tents of 25 beds each, a surgical dressing tent and a motor ambulance were established at the Mundelein terminal and at Lake Bluff by the Rapid Transit Company. Along the route from Chicago to Mundelein eighteen special first aid stations in charge of trained staffs were set up at frequent intervals.

At 3 o'clock on the morning of the appointed day every employee of the two systems, from chief executive down to platform men, was at his post, ready for the



Completely Equipped Rapid Transit Hospital Car at Mundelein Terminal

The first aid tents located between loading platforms had a capacity of 25 beds each. Across the terminal tracks in the background is the control bridge from which railroad officials directed the movement of trains

supreme test. For the day the personnel of the Rapid Transit Company had been increased by 1,500 men, the majority of them employees of other Chicago public service organizations. One man was assigned to every 900 ft. of the right-of-way for the entire distance between Chicago and the terminal at Mundelein, and at the latter point something like 700 additional company representatives were on duty.

First of the endless procession of trains to arrive in Mundelein from Chicago was the magnificently appointed North Shore Line special bearing Cardinal Bonzano and other dignitaries of the church. Appropriately draped in national and papal colors, the train reached the seminary on the eve of the great day.

More than one-half of the entire equipment of the Rapid Transit Lines, or 932 cars, was assigned to the Mundelein service, and at 4 o'clock the next morning trains of six cars each had begun operating out of the Jackson Park and Loomis Street terminals in Chicago at four-minute intervals. From 58th Street, where the two elevated divisions converge, a special train left for Mundelein every two minutes. Responding to the exhortations of railroad officials to start early, excited crowds had gathered at every station long before the hour of departure of the first train. Hundreds of pilgrims, fearing that they might not be able to board the crowded trains, spent the night on elevated station platforms. Down in the Loop district, at the Adams

IN NEARLY ten hours of uninterrupted loading the entire throng of more than 225,000 who had arrived on 372 Rapid Transit and North Shore trains and an additional 50,000 who forsook motor cars and other means of transportation by which they had come, to return by way of the more convenient electric lines, were hauled away from the Mundelein terminal. The three steam railroads, carrying a joint load of only about 75 per cent of the original estimate, were able to handle only 85,000 passengers, or less than one-third of the traffic over the Rapid Transit and North Shore Line. Counting each trip made by a Rapid Transit car, and each one made at least three round trips that day, it was estimated that 15 miles of electric cars were employed in carrying the great mass of pilgrims from and to Chicago. The last train, heavily loaded with company employees and policemen, many of whom had been on duty for upward of 24 hours without relief, left the Mundelein terminal for Chicago at 11:30 p.m.

Street terminal, the lines of waiting pilgrims and clergy frequently extended for blocks. The same surging crowds met the flag-bedecked trains at every stop to Howard Street, where, switching over to the Skokie Valley route of the North Shore Line, the heavily loaded trains continued on to Mundelein without further haltings. Where safety is a prime consideration, as it was in the handling of these 150,000 or more people of all ages who sought transportation from Chicago by electric line, speed was not a factor, and the 40-mile trip to Mundelein, ordinarily requiring an hour, was made on that day in the average time of two hours and a half.

By distributing round-trip tickets to the various parish headquarters several days in advance and advertising their sale at conveniently located booths throughout the city the Rapid Transit Company hoped to eliminate much of the congestion at regular stations on the day of the trek to Mundelein. A definite hour for starting was given to each ticket purchaser. Up until the very eve of the pilgrimage, however, only 60,000 tickets had been sold, and in consequence considerable delay was experienced in boarding trains at many stations on the morning of the 24th.



Flag-Draped North Shore Line Special Train on Which Papal Legate and Nine Visiting Cardinals Were Taken from Chicago to Seminary Grounds in Mundelein

All available equipment of the North Shore Line was consigned to the shuttle service on the Lake-Bluff-Mundelein branch and to the transportation of pilgrims from points north of Chicago on the old lake shore route. Simultaneous with the early morning service from Chicago, five-car trains were operated out of the North Shore terminal in Milwaukee on a fifteen-minute headway. In the course of ten hours an estimated total of 25,000 passengers were transferred from these trains to the shuttle cars at Lake Bluff.

100,000 STORM STOCKADE DURING STORM

By 10 o'clock in the morning—six hours after the migration began—the North Shore and Rapid Transit Lines had delivered 130,000 at the gates of the seminary. Trains carrying anywhere from 600 to 800 passengers were arriving at the Mundelein terminal, discharging their load and started back to Chicago frequently in less than a minute's time. Including the shuttle trains from Lake Bluff, a trainload of pilgrims entered the terminal regularly every 40 seconds for eight consecutive hours. As late as 3 o'clock in the afternoon special trains were still leaving Chicago as fast as they could be loaded. Long before the incoming traffic began to dwindle, however, thousands of the more than 400,000 pilgrims at Mundelein, hopeful of returning to the city before the rush was on, commenced to storm the gates of the stockade. A sudden rainstorm which struck the seminary grounds just as the procession of the blessed sacrament around the shores of the lake was about to start brought a frenzied crowd of fully 100,000 down on the terminal. The situation was acute, and despite the heroic efforts of 600 Chicago policemen and several detachments of state militia and the pleadings of company officials the clamorous mob all but swept aside the walls of the stockade in an effort to reach the trains. Although several persons were injured in the mad dash, it is considered providential that not a single fatality occurred.

40,000 DISPATCHED AN HOUR

From the control bridge B. J. Fallon, vice-president of the Rapid Transit Company, and B. J. Arnold, assistant general manager, surveyed the menacing throngs and by speeding up the movement of trains through the "bottle-neck" entrance to the terminal finally succeeded in loading 40,000 passengers per hour and sending out one train for Chicago every 55 seconds.

The crowd, bedraggled from the rain and exhausted by the long trip and emotional setting of the occasion, was difficult to handle, but when the rain subsided and it could be seen that the railroad was doing everything in its power to expedite the return to Chicago and other points good humor again prevailed and the confusion was abated.

Safety Pays in Milwaukee

FIFTY PER CENT reduction in accidents of all kinds was made by the rolling stock department of the Milwaukee Electric Railway & Light Company during 1925. The department had a smaller number of lost time accidents to employees than ever before, and for the fourth year there was not a fatal accident, according to an article by A. W. Koehler, superintendent of accident prevention, in the May issue of *National Safety News*.

According to the writer, the department comprises

842 employees. Every accident is thoroughly investigated, the primary cause being determined and definite responsibility fixed. The foreman makes the original accident report, which is signed by himself and the safety committee man from his department. It is then passed on for review by the general foreman and the superintendent, who determine the kind and degree of discipline necessary to be administered. When the accident is due to gross negligence on the part of an employee, temporary suspension may follow. Habitual or willful violation of the safety rules is held to be reasonable cause for discharge.

Although every man is considered responsible for any accident in which he may be involved, the foreman is accountable for the general safety of all of the employees in his division. He is expected to be continually on the alert for any unsafe practices or questionable methods which may have been introduced. In each major division of the department there is also a safety committee man, appointed by the superintendent. These men hold office for one year, and memberships then rotate so that the influence of the active safety committee experience was spread through the department.

Energetic Campaign for Paving Relief at Wheeling

"STREET CARS do not wear out the paving. Place the expense where it belongs." Such is the slogan used by the Wheeling Traction Company, Wheeling, W. Va., in an energetic campaign to secure relief from paving burdens.

A series of advertisements has been published by the company in the local papers, appearing one week apart. Newspapers in neighboring cities have also been used

WHICH DO YOU PREFER

Paved Streets

or

Better Service?

Every Dollar Spent for Paving
Means a Dollar Less for
Improving

Street Car Service



Place The Expense Where It Belongs

Typical
Advertisement
Used by the
Wheeling Traction
Company
in Its
Campaign
for Relief
from
Paving Burdens

in this campaign. Most of the advertisements have been featured by a drawing which showed the damage done to paving by heavy motor trucks. An accompanying reproduction of one of the advertisements used in the campaign shows this sketch. Mention has been made in the advertisements to the relief secured by electric railways in Massachusetts and Connecticut and in the cities of Indianapolis, Jackson, Seattle, Toledo and Cleveland.

Havana Railway Operation Combines American and Cuban Methods

**Extremely Narrow Streets and Close Spacing of Stops Create Operating Difficulties—Fares Are Low and No Standing Passengers Are Carried—
Double Trolley Wire Is Used, Supported by Unique Overhead Construction**

ELECTRIC railway operation in Havana, Cuba, during the 25 years of its existence has developed somewhat along the same lines as American operation, but it is characterized also by several peculiar local practices. Previous to 1900 local transportation was furnished only by horse cars. The operating company was owned and controlled locally. The present agency supplying transportation, however, the Havana Electric Railway, Light & Power Company, is a subsidiary of the Electric Bond & Share Company of New York. The system embraces some 96 miles of single track, 82 miles of which is in the city and 14 miles interurban. Interurban trackage is operated by a separate company, which in its turn is a subsidiary of the Havana Electric Railway, Light & Power Company.

Despite lively bus competition the railway carries on the average 10,300,000 revenue passengers per month. The fare is 5 cents straight for all persons more than four years old. Tickets are sold, but only to government employees. This is done merely as a matter of accommodation to do away with the necessity of their signing vouchers for each 5-cent fare paid. Transfers are issued free. Revenue per car-mile averages 30.5 cents and operating ratio is about 72 per cent.

During the peak a maximum of 522 cars are in operation. In the middle of the day, however, this number falls to 320. In Havana employees are granted two hours for lunch, usually between 11 a.m. and 1 p.m. This enables them to go home, a privilege of which practically all make use. Thus there are four peaks in the traffic, one early in the morning, one about 11 a.m., another at 1 p.m., and the last and heaviest one about 5 o'clock in the afternoon.

In general the car routes come into the city from the outlying districts and make a loop around several blocks adjoining the harbor, returning by the same streets. A few routes do not come downtown, but connect the different suburbs. During the rush hours a headway of three minutes to five minutes is provided on all lines except those serving the smaller suburbs. In the non-rush hours the headways are sometimes as long as eight minutes to fifteen minutes. Most of the more densely populated suburbs, however, can be reached by more than one car line, so that the service is actually



Small Single-Track Cars and a Double Overhead Trolley Wire System Are Characteristic Features of Electric Railway Operation in Havana

more frequent than would appear. Free transfers facilitate the use of different routes for reaching one destination. During the night 30-minute owl car service is maintained to most of the outlying districts.

Operation of the numerous bus lines has not seriously affected the revenue of the railway company. A majority of the buses are vehicles of inferior quality, having been imported second-hand from the United States and rebuilt. The fare is the same as on the cars and the buses are well patronized, passengers frequently hanging on to the steps or fenders in order to ride. They serve sparsely-settled suburbs lying so far out that up to the present it has not appeared profitable to extend the rail lines. The loss of revenue on the cars has been so slight that the company has not considered it necessary to take steps to combat this competition.

Free transfers are issued at all points where two or more car routes intersect. By the use of transfers it



Railway Operation in Havana Is Hampered by Narrow Streets

At left, when rounding a curve it is frequently necessary to lift up the fender to prevent it striking the curbstone.

At right, U-shaped brackets of iron piping are used on narrow streets to support the overhead wiring.

Below, narrowness of the streets in Havana has necessitated placing of the car tracks on one side to permit passing of a vehicle.



is possible to ride from practically any part of the city to any other part for 5 cents. Inasmuch as the city is rather closely built up and several of the suburbs on the west lying outside the city limits are served by the separate interurban company, the longest ride possible for a single fare is not much more than 5 miles. Many city cars operate over the tracks of this subsidiary, but an additional fare is collected when crossing the city limits.

NARROW STREETS MAKE OPERATION DIFFICULT

The older sections of Havana have many extremely narrow streets and sidewalks. Although traffic is permitted only in one direction on such streets, space must be provided for an automobile or horse-drawn vehicle and a street car to pass. This has necessitated the

placing of the tracks at one side of the street rather than in the center. To provide sufficient radius to enable cars to turn a corner the tracks must be on the outside of the curve. This makes necessary a frequent shifting of the tracks from one side of the street to the other. At corners where two or more lines meet many simple and reverse curves are required.

Another difficulty in turning corners is that the fenders run up on the sidewalk. Great care must be exercised by the motormen when rounding a corner not to upset pedestrians on the sidewalk. In many places the fender will jam against the curb unless the motorman raises it before turning the corner. The switch iron is supplied with a hook at one end for lifting the fender. It is a duty of the conductor to ring the gong almost continuously to warn pedestrians.

Owing to a stipulation in the franchise made at the time when the United States Army was in control of the affairs of the city, the company is not permitted to use its rails for the return electrical circuit but is obliged to use the double overhead wire system. On narrow streets it has been found advantageous to support the trolley wires by inverted U's of 3-in. wrought-iron pipe. The legs of these supports extend into the ground alongside the buildings on each side of the street. The piping fits snugly against the buildings and reduces the obstruction in the street and sidewalk to a minimum. That part of the piping which crosses the street overhead furnishes the necessary lateral strength to permit supporting the trolley wires in the usual manner. On wide streets trolley wires are supported by steel poles and span wires.

All trackage is of standard gage and is constructed of 89-lb. girder rail. The company paves between its tracks and for a distance of about 50 cm. (approximately 20 in.) on each side. As a rule the same material is used for paving the railway area as is used elsewhere on the street, whether granite blocks, asphalt or macadam. On certain streets paved with asphalt, however, granite blocks have been used for the railway area on account of the lower maintenance cost of this type of paving.

NARROW STREETS AND CLOSE STOP SPACING AFFECT CAR DESIGN

Cars stop at every street corner, and as the streets in the older part of the city are very close together the average distance between car stops is not more than 60 or 70 yd. This makes it desirable to operate lightweight cars. Those used are of the single-truck type with inclosed or partly inclosed platforms, weighing from 18,000 to 19,000 lb., and seating 36 passengers. They are built by the company in its own shop, using Brill 21-E trucks. Native hard woods are used in the body construction. Some of the cars are equipped with two 25-hp. motors, while others have two 35-hp. motors. The latter type is gradually replacing the former.

City ordinances permit a maximum speed of operation of 25 km. per hour (approximately 15½ m.p.h.) on wide streets, and 12 km. per hour (7½ m.p.h.) on narrow streets. In spite of the narrow streets and frequent stops the city cars average about 8½ m.p.h., and the suburban cars approximately 11½ m.p.h. There are few heavy grades on the system and those which do exist are grades. Cars are equipped only with hand brakes, but these have been found to answer all requirements.

Power is generated in the company's own power plant, both oil and coal being used for fuel. Electricity and gas are furnished also to the general public both for light, power and heat. The company has a contract for illuminating all the streets and public parks of the city, both gas and electricity being used for this purpose.

Full advantage is taken by the company of every opportunity to sell advertising space. The demand for it has been such that not only the usual space along the inside of the car roof is used for this purpose, but also the front bulkheads and the upper half of the window sash. Advertisements are painted on the upper part of the windows, as shown in one of the accompanying illustrations.

To a stranger the first street car ride in Havana is interesting. Regulations require that the passenger

enter the car at the rear and leave at the front. When you hand the conductor your fare he takes out of his pocket a small wrench, made especially for this purpose, and turns a square iron rod running along one side of the top of the car and connecting with the register. By this means he rings up your fare.

SPANISH CUSTOMS GIVE LOCAL COLOR TO OPERATING PRACTICES

There are no push buttons with which to signal the motorman. When you want the car to stop at the next corner you simply say "pst" (the favorite way of calling attention among Spaniards), and when the conductor looks at you, you wave your hand toward the front of the car. The conductor will then pull the bell rope once to signal the motorman. When you want a transfer, you do the same thing, except that instead of waving your hand toward the front of the car you wave it several times in whatever direction you want to proceed on your journey. Children like to give the "pst" sign, just as they like to push the signal button in the United States.

Newsboys and vendors of peanuts, flowers, etc., board cars and, without paying fare, ride a block or so while passing through the car offering their wares for sale. They do this without objection on the part of the conductor, who may even make change for them if they do not have it. They must, however, enter the car from the rear, for it is against the regulations for anyone but policemen and employees of the railway to board a car at the front end.

There are no straphangers in Havana street cars, because there are no straps to hang on. When all the seats in a car are taken, the conductor usually closes the gates of the rear platform and admits no more passengers until some seats become vacant. He will refuse admittance to women especially. Women wanting to board a car and seeing that it is crowded call "Hay asiento?" (Is there a seat?) to the conductor before trying to enter.

During the rush hours, when everybody wants to get home as quickly as possible, people sometimes enter cars the seats in which are all filled and stand on the rear platform. If the person is a woman, the conductor may even permit her to stand in the aisle, a thing he seldom permits men to do. On such occasions it happens only infrequently that a man will get up and offer his seat to the lady who is standing. On the other hand, if a man occupies a seat alone and a woman sits down beside him, he will jump up like a jack-in-the-box, take off his hat, bow to her, and offer her the seat next to the window, that being considered the more pleasant one to occupy.

Scrapped After Twenty-one Years of Service

AUTOMOBILE competition has destined four of the fleet of the Lake Minnetonka passenger steamers of the Twin City Rapid Transit Company, Minneapolis, Minn., to a 70-ft.-deep watery grave. Two were sunk recently and two more are to go, after 21 years of service. These boats for years met the electric trains and carried passengers to points off the line, and also carried sightseeing loads around the lake. Private automobiles and bus lines destroyed the usefulness of the boats.

One Owner's Faith in the Trolley

SECOND ARTICLE

**In the Rehabilitation of the Steubenville, East Liverpool & Beaver Valley Traction System
Particular Attention Was Paid to the Rolling Stock—New Cars Were
Purchased and Old Cars Rebuilt to Give Better Service**

WHEN the rehabilitation of the Steubenville, East Liverpool & Beaver Valley Traction Company was decided on by C. A. Smith, it was found necessary to put the rolling stock in such condition that it would be suitable for the projected service.

Purchase of 25 Brill safety cars, the first step toward a program of more service at less cost, was undertaken during 1923. These are of the standard 32-seat capacity with double-end equipment, but differ in several important respects from the Birney model. The body design is of the double-door rather than single-

than they possessed when bought. The trucks, of the Brill diamond-frame type, are being strengthened. To eliminate nosing due to the bolster coil spring becoming lopsided, the spring was replaced by a spring-borne iron block filler.



The "Ceramic," a Car that Is Proving the Public Is Glad to Ride the Electric Line When Speed, Spaciousness, Safety and Comfort Are Combined

The trucks of the "Ceramic" were rebuilt to provide for easy riding.

The circle bar is now mounted inside instead of outside.

Ball center bearings and roller side bearings are used.

The bolster is suspended from gusset plates instead of the transom.

Pillow block suspension of the spring ends is used.

In the "Ceramic" you make your choice of seats. They're all good.



door type. The trucks are J. G. Brill No. 79E-1. Since the principal use of these cars would be on the very hilly local routes in East Liverpool, Chester and Steubenville, they were also higher powered than ordinary Birneys. Two GE-247-A motors with K-63 control, Nuttall helical gears, GE electrolytic arresters and the Safety Car Devices apparatus are the main elements of the propulsion and braking equipment. The motors are geared for a maximum speed of 28 m.p.h. to take care of operation over the better levels of the main line.

There are now passing through the shops fifteen center-entrance cars of Pittsburgh type purchased in 1916. These are not only being converted to one-man, two-man operation, but are also being reconstructed to secure greater strength and more passenger comfort

Standard turnbuckles are being substituted for the dead lever type of brake rigging, and because of this change, a floating center bar is replacing the original rigid bar. The net result is expected to be a truck that will remain square and journal boxes that will not tilt under hard service.

Early in 1925 high upkeep and lack of need for train operation led to the replacement of type M control with type K-35-JJ control and line switch. The four GE-247-A motors, geared for a maximum running speed of 35 m.p.h., remain, except that they will be used with 26-in. diameter instead of 24-in. wheels to secure better clearances and higher speeds.

In altering the car body, the front-exit single-folding door with 29-in. clear opening is being replaced by

double folding doors of 52-in. clearance. This change necessitated cutting back the underframe, but without interfering with the diaphragm. Only a 4-in. channel bar of greater thickness replaced the original pressed-steel channel in the hood to offset the structural weakening caused by lengthening the front platform.

As in the Pittsburgh center-entrance cars, one side is taken up by a longitudinal seat. The original No. 14 gage sheathing on this side is being backed with No. 12 material to strengthen the body, but an air gap of 2½ in. permits better heating also. Car warmth will be further promoted by adding a second floor at right angles to the original single floor. While this work is in progress, the motor openings are reduced from four to two for the sake of noise reduction. Kass safety treads are being added on the steps and landing platforms.

One of the center doors on each side is being paneled, still leaving a clearance of 31½ in. On

Crouse-Hinds headlights of 150-watt capacity replace an older C-H design.

With the operating economies which have been made possible by this reconstruction for normal one-man operation, the management of the company has been able to undertake a program for shorter headways, as will be recounted later in this series of articles.



Upper right, before the change. Above, the front passageway has been changed from a single 29-in. door to a double 52-in. door, while one of the center doors has been changed. Right, the interior before remodeling. Below, rattan upholstery has been replaced by Kemi-Suede; electric heat takes the place of hot air; the center well has been simplified, and the lighting has been improved.



The Side Door Cars of This Type Have Been Converted for One-Man Service

occasions when these cars are used in two-man operation, the conductor will be stationed with his farebox in front of the new panel. The remaining double-leaf door on each side will be manually operated, either by a conductor or by a street inspector, according to whether two-man or one-man operation is in effect. The doors at the front or operator's end are being fitted with individual National Pneumatic engines. When these doors are open, vestibule lamps burn; when they are closed, the lights go out automatically. The line switch is interlocked to prevent the car from starting with doors open. Each of the two doors at the front is independently controlled, but can be operated simultaneously.

VARIOUS FEATURES CATER TO PASSENGER COMFORT

Passenger comfort has been increased by replacing the stove and motor-blower heater with Westinghouse electric heaters and Consolidated thermostats. Removal of the stove gives room for another double cross-seat. The seats are being covered with Kemi-Suede. Another feature for the passenger's comfort is the use of extended flush-type direct lighting fixtures with shades instead of bare lamps. The use of ten 56-watt lamps on two circuits will give more satisfactory illumination than the old-style lamps on three circuits.

To bring its interurban rolling stock up to the standards of speed and luxury demanded by an automotive-trained public, the management has begun the thorough rebuilding and reupholstering of its existing interurban cars, aside from plans for eight entirely new cars.

The first rebuilt car, named "Ceramic," went into service on Jan. 10, 1926, and made such a hit that plans were immediately begun for like work on a second car to be called "Fort Steuben," after a prominent regional name in Steubenville. The following account will show how thoroughly the interurban cars are to be overhauled and modernized to appeal to a discriminating public:

The new "Ceramic" was a 48-ft. wooden car. Its body was reinforced with No. 14 gage steel. Then it was painted in Packard cream on the sides, but with yellow for the dashers for maximum visibility. The striping is uniform with the dashers. The roof is light buff with black striping leading therefrom.

The original seating consisted of eighteen double cross-seats and four double longitudinal corner seats in Pantasote, totaling 44. These seats have been replaced by plush-upholstered seats of four different designs to get an idea of what the public likes best. The central section of the "Ceramic" has ten double cross-seats of standard design but rebuilt and upholstered in plush. Adjacent to these at each end is a pair of swiveling twin-bucket seats, believed to be the first of their kind on an electric railway. Next to each set of these double seats is a pair of individual swiveling bucket chairs, and, finally, fixed twin bucket seats in each corner. The total seating capacity has been cut from 44 to 40. The more important point is that the car as a unit is earning more money.

ROOMINESS OF SEATING ARRANGEMENT GIVES OPPORTUNITY FOR SOCIABILITY

Perhaps the most pleasing feature of the bucket seats is that a party up to ten persons can arrange themselves so as to be almost face to face, whereas in other seat arrangements they could be comfortable only in twos. For sociability, this arrangement is decidedly superior to personal motor cars or to a motor coach with transverse seats. Another advantage is that more convenient spaces are left for the grips and suitcases of the many traveling men who use this railway between Beaver, East Liverpool and Steubenville. These cars were not built with parcel racks, but coat hangers have been added in the "Ceramic."

There are no rods or bars to obstruct the vision or diminish the roominess of the car to the eye, except for a signal cord. The cord hangers are covered with plush to match the seat upholstery.

One of the questions before the management was whether the "Ceramic" and similar de luxe cars should be run during hours when they would be carrying loads of begrimed workmen to and from their jobs. It was decided that the money of these regular riders was certainly as good as that of any casual and that the best was none too good for them. To meet the situation in the right spirit, towels are placed on the backs of the swivel chairs twice a day. These towels, it may be added, were embroidered with "C" or "Ceramic" by the girls at the office because of their pride in this development.

The Taylor high-speed trucks originally under this type of car have been greatly strengthened. While the side frame and journal boxes were retained, M.C.B. standards now apply to the levers, brake beams, center brake bar, swing links, etc., to permit interchange with M.C.B. trucks of Brill and Baldwin make. The new axels are 5½-in. A.E.R.E.A. standard instead of 5 in. as previously used.

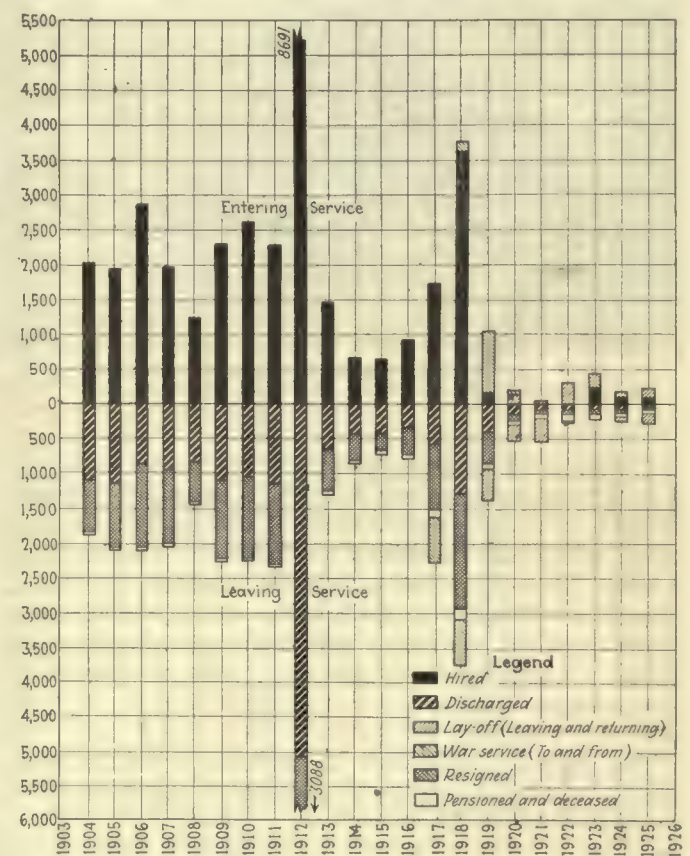
Formerly, the sand supply for the pneumatic sanders was in boxes under the seats, which, of course, was more or less discommoding to passengers. Sand is now carried in narrow, deep (4 in. x 30 in.) compartments built between the end seats and the bulkheads.

As regards the electrical equipment, while the original Westinghouse No. 93-A-2 motors remain, they have

been tuned up in every part. The control has been changed from K-14 to HL. Piping has been made as inconspicuous as possible by being laid neatly against the car paneling. All wiring is concealed. Headlight, lighting and other auxiliary switches are mounted in a vestibule compartment under which is a chamber for the governor, jack and trolley pick-up.

Improved Employment Record in Boston Reflects Good Condition

SIX years of comparative quiet have passed on the Boston Elevated, as far as the turnover of the blue uniformed men is concerned. The accompanying chart shows the marked change that has taken place in this class of employment since 1904. For many years it was quite customary to employ from 1,500 to 2,000 men each year, not for expansion of service, but



Boston Elevated Record for Its Blue Uniformed Employees Shows Marked Improvement During the Last Six Years

to take the place of men who were discharged for cause or who were otherwise laid off or resigned.

For the years 1919, 1920 and 1921 no men were employed. In the year 1923, 237 men were employed. In the year following that, 99, and for the last year only 83 new men were taken on. Likewise the number of men who were discharged has been very greatly reduced.

Many factors contribute to this desirable condition; the increase in wages, provision of an eight-hour day, introduction of one-man operation, and the operation of elevated trains with guards operating two cars each, and last, but of greatest importance, the many efforts of the management to build up the spirit of co-operation on the basis of permanency of employment.

Notable Safety Work in Savannah

The Company Was the Winner Over Two Competitors in a Railway Safety Contest—An Account Is Given of the Methods Followed in Promoting Safety Through Team Contests, Maintenance of Individual Records of Trainmen and Careful Analysis of the Causes of Casualties



In Savannah There Are Many of These Small, Open Grassed Squares in the Main Streets. The Roadway Passes Around Them, but the Electric Track Passes Through Them

ON LAST Easter Sunday all the trainmen of the Savannah Electric & Power Company blossomed out in new straw hats. The reason was that through the care exercised by them the company was winner in a six months accident contest in which Savannah, Jacksonville and Tampa participated. The losers paid for the hats. The final score showed that in the six months ended March 1, 1926, the record of the Savannah company was the large number of 2,946 miles per accident.

The record just quoted is even more notable than might appear at first sight because of the very strict definition used of the term "accident." The accidents recorded are not confined to casualties in which some degree of responsibility attaches to the company. Any occurrence to persons or property, other than ordinary wear and tear to the car and the track, caused by the movement of the car on the street is counted as an accident. Thus, if an automobile should run into the rear of a standing car, it is called an accident.

The fine record of safe operation in Savannah made during this contest was not the result of chance nor mere superficial attention

to the usual safety precautions. For a number of years the company has paid a great deal of consideration not only to developing cordial co-operation by all employees in safe operation but to a study of the causes of accidents. In this way it has been able to learn how and where most of the accidents on its system occur. The adoption of methods to avoid accidents has thus become much more easy.

An essential feature of the means to encourage the employees in safe operation is a continuous contest between selected teams of the trainmen as to low accident records. The layout of the Savannah property is such that all of the cars operate from one depot. Hence, it was not possible to organize these team contests between men in various divisions. Instead, six captains are chosen, and these men select in rotation the men to compose their teams. At the end of each month members of the team having the best record are the guests of the company at a dinner given at one of the local hotels. This event is made the occasion to a considerable extent of talks on safety. If the same team wins three months in succession each of the men on the team receives a motor-



A Considerable Part of the Track in Savannah Is on Reservation or Neutral Ground

man's cap as an extra reward. Up to the present three teams have won this crowning prize.

At the end of each year the men have the privilege of electing new team captains, though three of them have remained as captains since the plan was started.

In these interteam contests each accident counts as two points against the crew of the car involved in it. That is to say, if the car involved is a one-man car, the operator is penalized by two points. If it is a two-man car, the conductor and motorman are penalized by one point each. The company has only two routes on which two-man cars are used, these being suburban lines. All the rest of the operation is with one-man cars. The lines with two-man cars do not constitute a large proportion of the car mileage of the company, as on one line cars run only every half hour and on the other line only every hour.

In a sense, it might be considered unjust to charge against a crew unavoidable casualties, or those in which no negligence by the trainmen has been shown. This plan is followed for two reasons. One is that if an attempt were made to grade responsibility in the penalty attached, a very difficult problem would exist. The second reason is, it is found that with the reduction of all accidents the unavoidable ones also seem to grow less.

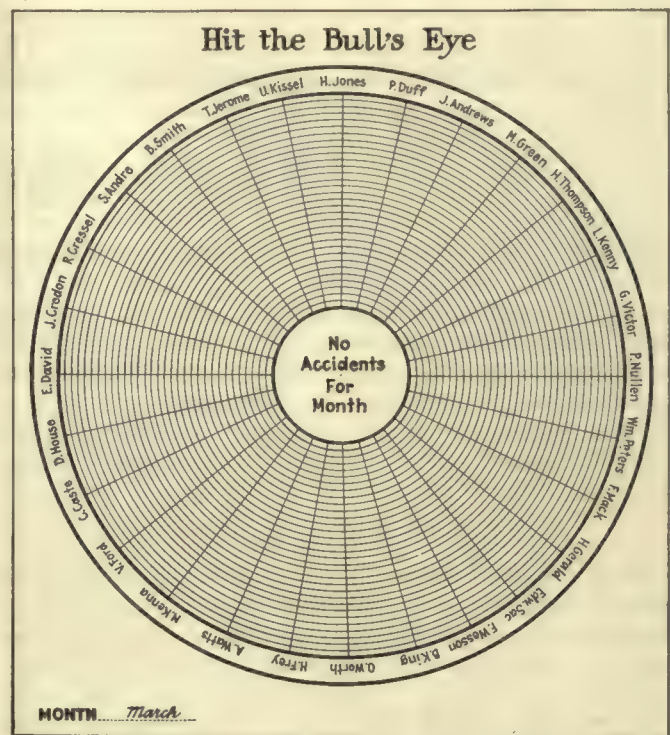
COMPARISON OF RECORDS

This plan means that some comparisons of records must be made daily so that the men may know the number of accidents charged against them. There are two records of this kind, one by teams and the other by individuals. The record by teams is plotted daily in the form of graphs, of which several copies are made. One of these is posted in the main office. Another is posted in the trainmen's waiting room. In the chart in the main office the record of each team in number of points charged against it cumulatively for the month is plotted in lines of different colors to represent the different teams. The one in the trainmen's waiting room also shows the number of accidents by teams cumulatively for each day of the month, but it is on a much larger scale and the lines are shown by strings of different colors rather than by being drawn in ink. The background of the board is black.

The daily records of the men of each team are recorded on what is known as a target. There are six of these, one for each team. The diameter of each target is about 36 in. The targets are mounted in a row in the trainmen's headquarters. Each target has 31 concentric circles to represent the days of the month and as many radii as there are men on the team whose records are being shown by the circles. The radii are marked with the names of the men composing the teams. The advance of each man toward the "no accident" center is indicated by a plug which is moved along his particular radius one circle each day he has no accidents. If a man has two accidents on the same day he is not moved forward one step for two days.

As explained, different colors are used on the charts to distinguish the several teams. These same colors are used for the centers of the several bullseyes.

These targets are painted on beaverboard. At the top of each are the words "Hit the Bullseye." By these targets it is possible for every man to know exactly where he stands and where every member of every



Centering Attention on Safety at Savannah

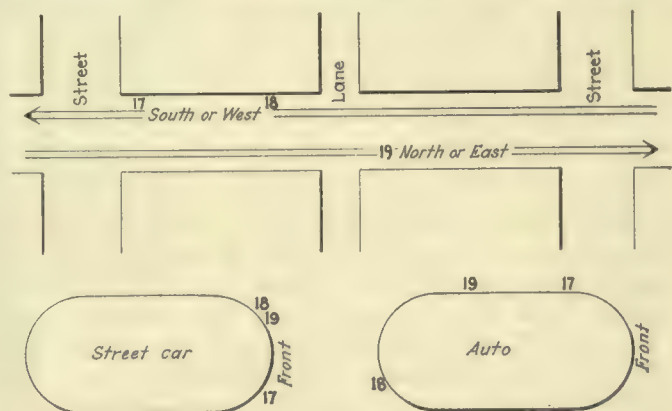
The train force is divided into teams and daily records of the individuals and each train are shown by pegs on a chart like this in the trainmen's headquarters. The object of each trainman is to hit the bullseye on the last day of each month by means of a perfect safety record.

other team stands in the monthly contest. There are about 26 men on each team.

Of course, in a contest of this kind, questions will always arise as to what should be called an "accident," even with the very specific rules which the company has on this point. For this reason there is a standing committee on disputes. It is made up of Fred C. Morton, general superintendent of the company; A. F. Solms, claim agent, and G. A. Webb, superintendent of transportation.

OTHER POSTED RECORDS

Besides the bullseyes or targets, there are a number of other records on safety in the trainmen's headquarters. One is the chart of records by teams, already mentioned. Another is a map of the system showing the location of automobile accidents. The purpose of



Charts Aid in Visualizing Causes of Accidents

Graphical records are kept monthly of the comparative locations on a typical block where automobile accidents occur and of the parts of the electric car and automobile hit. The numbers indicate the kind of accident. In the original charts two colors of ink are used, one to indicate that the car hit the automobile, the other that the automobile hit the car.

this map is to show the men the places where experience indicates this kind of accident is liable to occur. The map shows in red ink the locations of the accidents during the first six months of 1925 and in green ink those during the first part of 1926.

Another map of the same kind, but changed monthly, is kept in the superintendent's room. Adjoining it is a representation of the dial of a clock, but drawn to represent twenty-four hours. On this pins of different colors, each color representing a different kind of accident, are used as markers, so that with this clock and map there is a visual record of the place and time of each accident for the month. At the end of each month the data are transferred for comparative purposes to smaller maps and charts. By this method dangerous street crossings, etc., can be detected and arrangements made to protect them.

RECORDS HELP SAFETY

It is impossible through lack of space to present all of the records and the studies made by the company to determine where and how accidents occur most frequently, but a few of the principal forms will be mentioned.

A monthly record is kept with 20 classifications of kinds of accidents and 23 headings of vertical columns to indicate the part of car hit, type of car, etc. The classifications used follow:

Collision with pedestrians	Alighting from car
Collision at railroad crossings	Injuries on car
Collisions between cars	Injuries by doors
Collision, auto hit car	Ejectments and disturbances
Collision, car hit auto	Broken windows and doors
Collision with other vehicle	Split switches
Collision with animals	Fenders torn off
Derailments	Broken trolley poles
Damage to equipment	Broken trolley wire
Boarding car	Miscellaneous

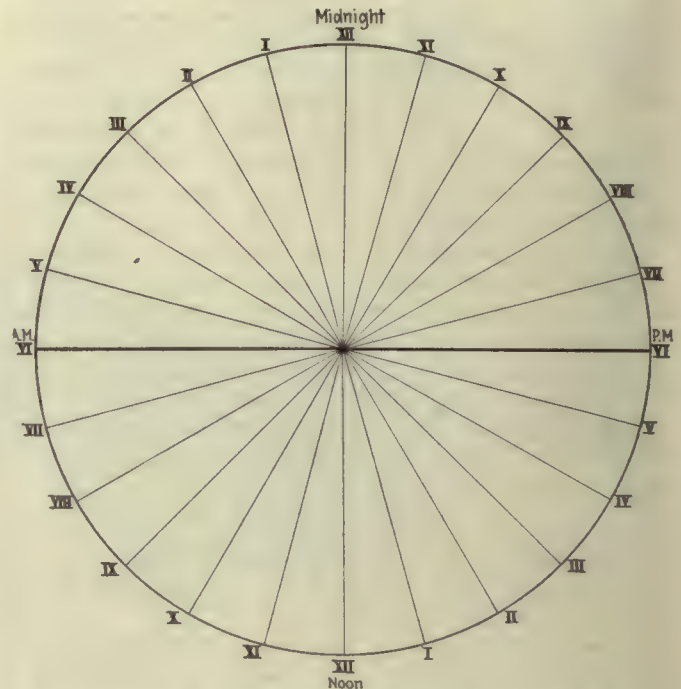
The headings for the vertical columns read as follows:

Part of car hit: Front, moving
 Part of car hit: Front, stopped
 Part of car hit: Rear, moving
 Part of car hit: Rear, stopped
 Part of car hit: Side, moving
 Part of car hit: Side, stopped
 Type of car, Birney, safety, one-man
 Type of car, reconstructed, d.t. one-man
 Type of car, old type
 Type of auto, passenger car
 Type of auto, truck
 Kind of driver, white man
 Kind of driver, negro
 Kind of driver, woman
 Length of service of operator—Less than six months
 Length of service of operator—Six to twelve months
 Length of service of operator—One to two years
 Length of service of operator—Two to three years
 Length of service of operator—Three years or over
 Responsibility—A
 Responsibility—B
 Responsibility—C
 Responsibility—D

In connection with these final four columns, the company designates as *A* accidents those in which the operators were entirely responsible; as *B* accidents those where the responsibility of the operator is open to question; as *C* accidents those where an employee other than a trainman is responsible, as with bad equipment, and as *D* accidents those in which outsiders are wholly responsible.

A special record is also kept of all automobile accidents, because in Savannah, as in most cities, they constitute a very large proportion of all of the accidents. In the written records on automobile accidents full

particulars are given of the nature of the accident, place of occurrence, time, cause, line, car number, etc. In addition, a diagrammatic record is kept, by months, of the positions in a typical block of the locations of all automobile accidents as well as the part or place on the car and auto which came into collision. Such charts, much reduced, are shown on the preceding page. In these charts the numbers "17," "18," "19" refer to the classification of these accidents used by the company,



One of Several Charts Used by the Savannah Electric & Power Company in Its Safety Work

A clock dial with space for 24 hours, like that above, and a map of the city are used to plot the place and time of every accident. Pins of various colors, each color representing a different kind of accident, are used as markers. These records are made daily. At the end of each month the data are transferred to maps and charts for comparative purpose. By this method dangerous street crossings, etc., can be detected.

while the positions of these numbers on the chart show the part of the vehicle or place where the accident occurred.

Hearty co-operation in this safety campaign has been received from the Police Department of Savannah, and that department has adopted several of the company's methods of locating hazardous corners and locations. Maps and charts are also kept by the department for the information of the patrolmen and traffic squad. As a result of these studies the police traffic department has installed many safety and boulevard stops, not only at hazardous street railway crossings but at many other blind and hazardous street crossings in the city. These studies have also disclosed points where traffic men should be located for short periods only, both weekdays and Sundays.

This aid to traffic accordingly has been supplied. In fact, it has been possible for the Police Department, through the information thus obtained, to locate its traffic squad properly and to gain far greater use of the men available by limiting their time to the points of greatest need and moving them to hazardous points as traffic conditions change.

With these methods of analyzing accidents it is not surprising that good records in safe operation are being made in Savannah.

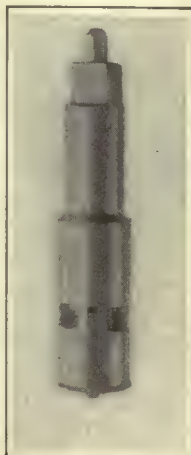
Maintenance Notes

Special Tools for Compressor Maintenance

GRINDING in valve seats in an air compressor valve head is no easy job. A special device, however, was developed in the Dallas Railway shops that has almost the touch of the human hand. This device was first mentioned in *ELECTRIC RAILWAY JOURNAL* for Aug. 8, 1925, page 210. The machine has been in continuous use since then, greatly lessening the cost of valve grinding. M. S. Crouch built the machine that does this work automatically. Both the machine and Mr. Crouch are seen in one of the accompanying illustrations. The machine is adjustable and can be swung in any position. It is driven by the small motor shown over a valve opening, the valve is dropped in place with a little grind-

ing compound put around the valve seat. The clamp of the grinding machine is attached to the valve stem and the machine set in motion. The machine makes half a dozen reciprocating motions similar to those of an operator doing the work by hand. Then the valve is lifted slightly, allowing the grinding compound again to cover the valve seat and the reciprocating process is continued for another half dozen or more revolutions.

A new device has been added to



Valve Seat Cutting Tool

The blades are expanded after the tool has been inserted in the valve chamber

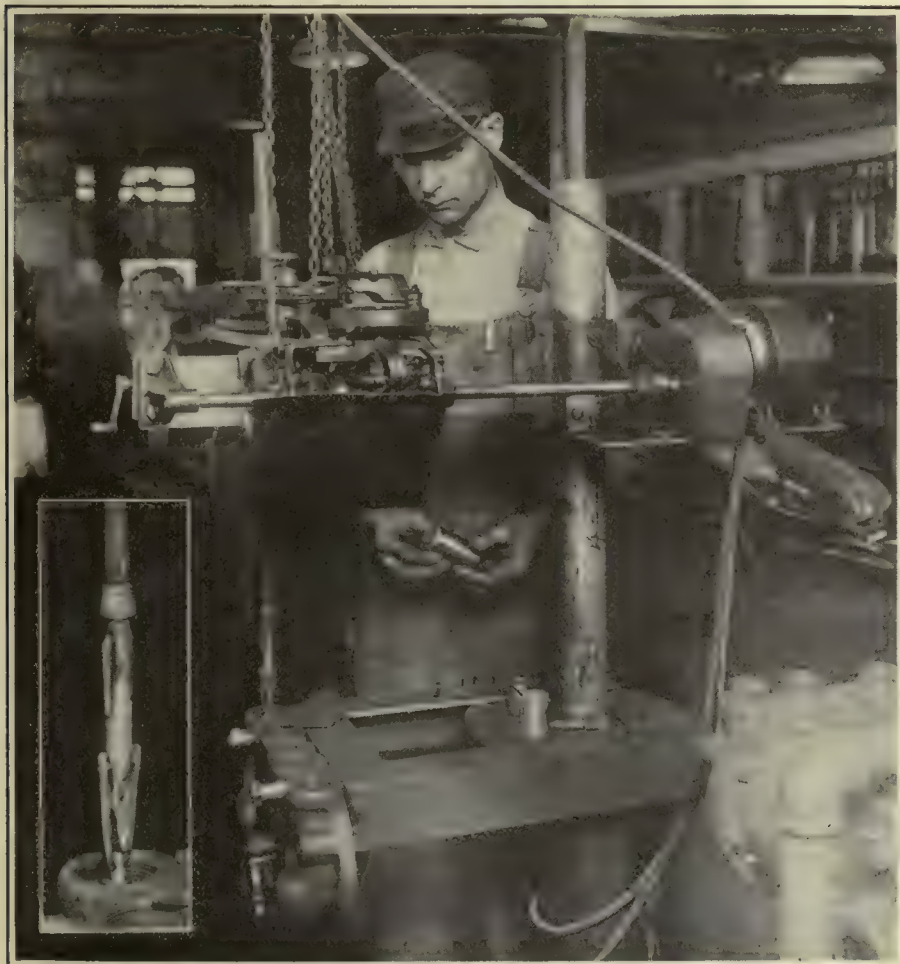
the air valve maintenance equipment of the Dallas Railway through the use of this extremely handy tool. As maintenance men know, the seats of air compressor valves become worn in a grooved or conical shape, and it is then desirable to remachine the valve seat in order to establish the correct taper. The difficulty is to get a machine through the hole, since it is necessary to cut the seat back a distance slightly greater than the upper end of the valve chamber.

To accomplish this Mr. Crouch has built the tool shown in one of the views. The cutting edges of the tool consist of four hardened blades which are set in the stem. Each blade is pivoted around the center, as can be seen in the illustration. One blade was pulled out as far as possible to show the construction while the others are in their normal positions.

This tool can be inserted into the valve chamber with the blades compressed inwardly. When it is inside, the stem at the upper end can be turned from left to right, which screws down a taper that forces out the blades in an even manner. When they have been extended sufficiently, the tool is clamped in a drill press and the valve seat is remachined. The process of unscrewing the stem and closing in the blades is necessary to remove the tool from the valve chamber after the machinery operation is completed.

Metal Cutting with Illuminating Gas

ILLUMINATING gas to replace acetylene, hydrogen and other fuel gases in combination with oxygen for metal cutting has been adopted at the Schenectady plant of the General Electric Company, following a comprehensive study of the economic needs of the various classes of work. A special oxy-illuminating gas torch was developed for the purpose, and is now being used for the cutting of risers in the steel foundry of that plant, varying in thickness from 1 to 20 in. This method is also used on machines in cutting intricate shapes from steel plate.



Mechanism for Automatically Grinding Air Compressor Valve and Seats Used in Dallas. The Cover Over the Glass Has Been Removed to Show the Details of Construction. Inset Shows Detail of Clamp that Engages Valve Stem



Cutting Riser from Large Rotor Casting

As a result of tests, it was found that illuminating gas is cheaper in machine cutting than either hydrogen or acetylene, while the speed of cutting after one starting is approximately equal for all gases. The advantages of the use of illuminating gas were found to be (1) availability; (2) elimination of delays and handling of tanks; (3) low cost; (4) safety, and (5) chemical and physical properties, permitting its use in a torch, equipped with a super heater,

thus effecting marked economies in the amount of oxygen required by the cutting jet.

General Salvage Man Reclaims Much Material

VARIOUS small parts such as screws, nuts, bolts, rods, nails, fuses, lighting sockets, etc., used by electric railways are sorted and reclaimed in the shops of the Department of Street Railways, Detroit, Mich., by a man who devotes his entire attention to the work. This man visits the various departments of the shop and picks up miscellaneous material, also outside shops send in their accumulations for sorting and testing. The salvage man goes over these accumulations of material at his bench, located in one corner of the shop. The various parts are placed in boxes so that uniform sizes are brought together. Poorly threaded screws and nuts are re-threaded or tapped. Fuses are tested and where labels are defaced or missing new labels are supplied. Various other parts are repaired where necessary. Work done in this way has proved of great convenience to other departments as well as being made profitable to the company.

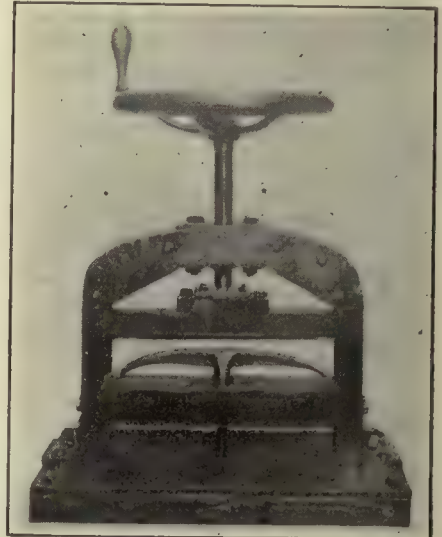


General Salvage Man in the Department of Street Railways, Detroit, Sorting Machine Screws and Placing Them in Proper Boxes

Press Reclaims Slightly Used Trolley Ears

BY JAMES SCOTT
Superintendent of Overhead Cleveland
Railway, Cleveland, Ohio

POLE relocation, span rearrangement, and removal of temporary and permanent trolley wires make necessary the removal of a surprisingly large number of trolley ears long before they are worn out on



Ear in Position Previous to Straightening

the lines of the Cleveland Railway. These ears are in good condition except for the half-moon bend which results from removal by the stripping iron. This bend cannot be removed satisfactorily or economically by hand, but the saving possible by reclamation of these ears warranted the construction of a special machine to perform this operation. Such a machine has been developed in our shops and by means of this an ear may be straightened quickly and accurately. The machine used resembles a letter press in appearance. A die is fitted into the base which is shaped to conform with the upper side of a new trolley ear. The movable element of the press consists of a metal block connected on the top by a ball and socket joint to a screw. This screw passes through the upper frame of the press. The lower face of this movable block consists of a metal strip which is shaped to conform to the under side of the groove of the ear.

To straighten the ear it is placed in the press with the boss resting on a coil spring, which extends up through the center of the lower die. The handwheel is then turned so as to close the press and force the ear into the die. A moderate force



Reclaimed Ear Ready for Reuse

so that it can be removed readily. The entire operation can be completed very quickly and an inexperienced operator can do the work so that the labor cost is very low. Ears reclaimed in this manner, with the exception of slightly worn lips, are equal to new ones.

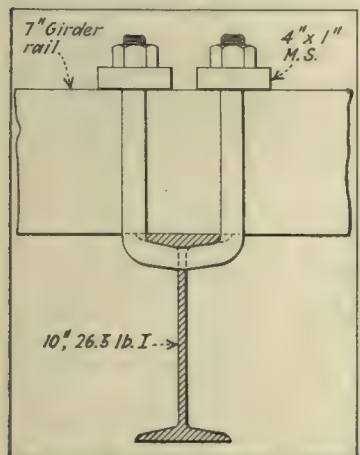
Another feature of this press provides for changing the lower die and straightening and reclaiming switch approaches in a manner similar to that used for the ears.

Monorail Installation Reduces Handling Cost

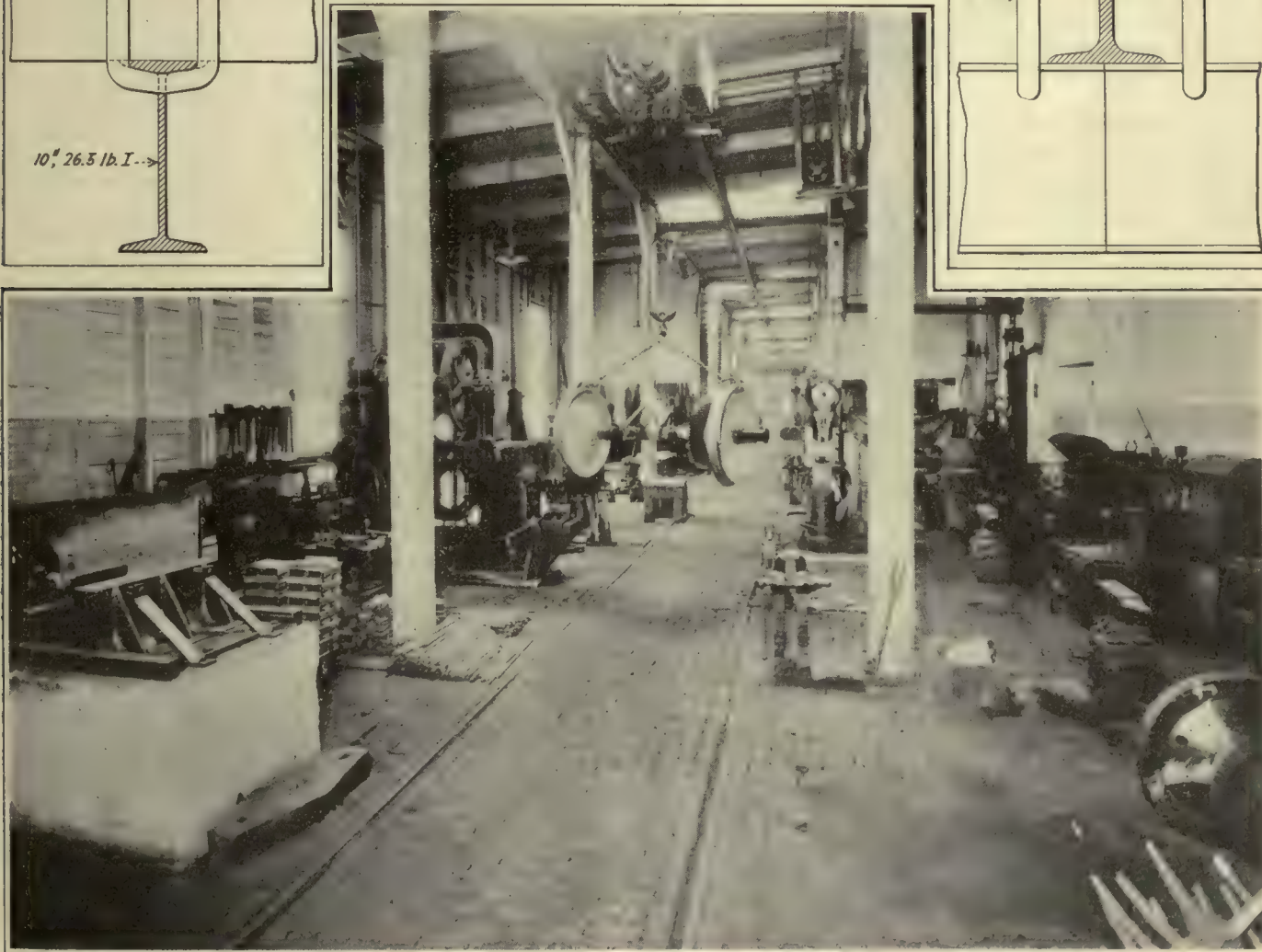
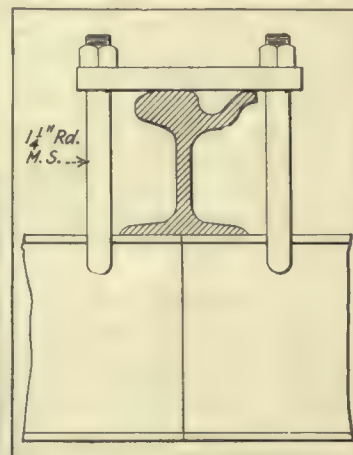
INSTALLATION of a 1½-ton monorail traveling hoist by the Eastern Massachusetts Street Railway in its Chelsea shops has speeded up production and lowered the cost of handling heavy materials between the various departments. Equip-

ment such as axles, wheels and motors were formerly transferred on hand trucks, which was a rather slow and expensive method compared to the present one. The electric hoist is equipped with variable speed control operating by ropes from the floor. It has a full load lifting speed of 26 ft. per minute and a traveling speed of 250 ft. per minute. An automatic limit feature is in use to prevent over-traveling of the hoist hook. This is self-resetting after operation.

The hoist operates on a 10-in., 26½-lb. I-beam track hung on cross rails spaced 15 ft. on centers. Cross members consist of 7-in. girder rail 10 ft. in length and attached to existing uprights by means of forged hangers. The I-beam track is suspended midway between uprights and secured in place with 1½-in. U bolts as shown in an accompanying sketch.



Electric Hoist and Monorail Arrangement Has Facilitated Handling of Material between Departments in Chelsea Shops of Eastern Massachusetts Street Railway. A 10-In., 26½-Lb. I-Beam Is Used for Monorail Track. Track Is Suspended from 7-In. Girder Rail Cross Members by 1½-In. Bolts.



Association News & Discussions

Bluff Point Meeting Well Attended

Many Phases of Bus Operation Discussed at New York Electric Railway Association Convention—Railway Operators and Manufacturer Representatives Gave Ten-Minute Talks on Live Topics in Their Fields

BUS operation occupied a prominent position on the program of the 44th annual convention of the New York Electric Railway Association on June 25 and 26. The meeting was held at the Hotel Champlain, Bluff Point, and was attended by about 350 persons. A feature of the program was a series of ten-minute talks by railway officials on live topics in electric railway operation. The subject in each case was left to the speaker. There was also a series of similar talks by representatives of manufacturing companies on recent developments in their particular fields. Two sessions of the association were held on June 25, and the annual banquet took place on the evening of June 26.

At the opening session on June 25 President W. J. Harvie called the meeting to order at about 9:45 o'clock and reviewed the progress made during the year in an address. An abstract follows:

PRESIDENTIAL ADDRESS

Mr. Harvie first briefly reviewed the work of the legislative committee and the program committee. He then emphasized the need of the companies, in considering new problems, like that of the motor bus, not to relegate to second thought the consideration of the electric car. "We still have it with us," he said, "and will have it for many years as the *pièce de résistance* of the business of transportation. We must, therefore, give it much more of our attention. None of us will deny that difficulties of successful operation do not diminish as the years go by, and that our problems require more alertness and acumen than formerly. Some of our burdens have become so heavy that they require special attention at our hands. Failure to correct them will inevitably result in inability to operate a much-needed service—a calamity due entirely to causes inherent in electric railway operation itself, and not due to the entry of the motor bus into the field of transportation." In conclusion, he said:

"A very considerable responsibility rests upon each of us to put our best thought on the problems that confront us, relieve our industry of unjust burdens, obtain an adequate return for service rendered, adopt new methods if necessary, and render service of quality and sufficiency to please our industry so that it will retain its place as a constantly helpful factor in the prog-

ress of our various communities. Only by so doing may we hope to make our business a profitable one."

COMMITTEE REPORTS

The treasurer's report showed disbursements for the year of \$22,324 and balance now on hand of \$7,428.

The accounting committee reported efforts made to induce the State Tax Commission to accept the reports made by the companies to the Public Service Commission and the Rapid Transit Commission. This would save the labor required to prepare two sets of reports. The committee also spoke of its work in endeavoring to get these two utility commissions to adopt the same classification of accounts.

A nominating committee consisting of the past-presidents present was appointed by President Harvie.

The legislative committee reported through Gen. Charles D. Newton of efforts made at the recent session of the State Legislature to reduce the paving burden and the gross receipts tax on electric railway companies. Though both bills introduced failed of passage, the prospects for securing some relief at the next session of the Legislature are good.

Three papers were presented as follows: "Motor-Vehicle Operation" by Roy R. Hadsell, New York State Railways, Rochester; "Legal Phases of Street Railways and Buses" by Alfred T. Davison, Third Avenue Railway, and "Taxation" by Ralph Norton, Interborough Rapid Transit Company. They will be found in abstract elsewhere in this issue.

In answer to an inquiry, Mr. Davison quoted from a decision in a recent case where a car of his company had collided with a bus operating unlawfully on the streets. The court held that gross or willful negligence of the operator of the trolley car would have to be proved before the railway company would be held responsible. In this case the question was one of property damage only, as no passengers were injured. The decision had been appealed by the bus owner.

TEN-MINUTE TALKS ON OPERATION

A feature of the meeting, as explained, was a series of ten-minute talks on operation by transportation men, and on new manufacturing kinks by representatives of manufacturing companies.

R. E. Danforth, formerly general manager Public Service Railway, Newark, N. J., said motor vehicle transportation was not a big element in city service in the near future, but it seemed large to the public because of a popular impression that the electric car was being superseded. Buses should be provided for those who want to ride on rubber, but it is just as important, if not more so, to keep the railway service up to date. Both public and trainmen must be educated, the latter in their duties and in ways to attract traffic. One of these is to wear a smile, as a grouchy operator repels passengers. Publicity also is needed.

W. E. Thompson, vice-president Third Avenue Railway, said that two of a transportation man's most difficult problems are how he can cut down the losses on lines that do not pay operating expenses and how he can take care of the peak loads on heavy lines. Experience with the bus during the last few years shows that in newly developed or sparsely settled territory, where the travel offering would not justify the construction and operation of an electric railway line, the bus can be used to advantage. Where a line has been operated for years at a loss and requires considerable rehabilitation is often another place where the trolley can be abandoned and service in the territory given with buses. In small towns, where the peak loads are not a factor, buses are also found useful. But for carrying large numbers of persons in and through congested centers, the use of the bus adds to the traffic congestion, gives slower movement and requires a higher fare.

An observation made in New York City in May of this year shows that on Fifth Avenue during the peak of the rush in the afternoon between Fourteenth Street and 57th Street, a distance of 2.1 miles, the average running time for a bus was 47 minutes or 2.7 m.p.h. The buses served an average of 75 passengers per unit and at nearly all of the stops prospective passengers were left standing on the corner. On the same days and at the same time on Third Avenue the average running time for an electric car was 18.2 minutes or 6.9 m.p.h. The average number of passengers served per unit was 118 and the electric car was taking care of all of the travel that offered. Fifth Avenue has a rapidly moving light traffic with good police regulation, while the traffic on Third Avenue is largely of trucks.

Mr. Thompson also referred to a national survey just completed by the American Electric Railway Association, showing that the cities where the trolley has been abandoned are small and in many instances are in places

where street car service would never have been attempted if buses had been available when the rails were laid. On the other hand there are now in daily operation 2,658 more closed electric cars in regular service than there were in 1919.

Continuing, he said that the dependability of service by the street car in all kinds of weather should be enough to convince anyone of its advantage over the bus, if there was no other reason. This was notably so in New York City last winter, where, during a heavy sleet storm, in a good many localities bus operation was completely suspended but the trolley cars were kept in operation.

On the more economical use of the streets by the car, Mr. Thompson said that at Broad and Market Streets, Newark, N. J., a recent two-hour traffic count showed that of the 44,000 persons transported 3,500 passenger automobiles carried 6,000, 826 buses carried 17,000 and 670 street cars carried 21,000 passengers. In other words, of the 44,000 passengers, four out of five were riding in street cars and buses, the street cars leading by a wide margin. In Chicago, according to a recent report, nearly 75 per cent of the passenger traffic in the central business district is carried by surface cars, which are only 10 per cent of the vehicles using the streets. In Atlanta, a check showed that 75.8 per cent of the people are carried by street cars, which form less than 9 per cent of the traffic in the street.

In conclusion, Mr. Thompson said recent railway reports from Philadelphia, Kansas City and the Public Service system in New Jersey show that their bus services were being conducted at a loss.

H. B. Weatherwax, vice-president United Traction Company, Albany, said that company now has 30 buses (including four trackless trolleys), is adding 25 buses now and may add 25 more before the end of the summer. The bus lines on this system are not profitable, but in general have been put where trolley lines would not be or had not been profitable. Buses have proved especially popular with women passengers and have increased the off-peak riding. Elderly people also like their ability to make stops at the curb. The speed is usually higher than that of the trolley line replaced, and the gross receipts per vehicle-mile are often higher.

T. C. Cherry, vice-president and general manager Rochester & Syracuse Railroad, urged the need of giving good service but at a remunerative fare. He thought, in general, the city bus fare should be 10 cents, and the interurban bus fare should be 5 cents a mile.

J. F. Hamilton, president New York State Railways, Rochester, which operates a number of bus lines, said these lines were paying operating expenses including a fair rate of depreciation. He does not contemplate at present any material bus extensions. Bus operation is financially not a great asset, but it is very helpful in improving public relations. Mr. Hamilton then spoke of the good results following three years'

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Col.

July 8-10—Texas-Southwest Railway Claim Agents Association, convention, Arlington Hotel, Hot Springs, Ark.

July 22—New England Street Railway Club, annual outing, Portland, Me.

July 23-24—Central Electric Railway Accountants' Association, meeting, Drake Hotel, Chicago, Ill.

Aug. 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Michigan.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

work in safety on his property. Safety competitions are being held between different divisions of the trainmen. They have been of great value.

George MacLeod, vice-president and general manager Buffalo & Erie Railway, spoke of the novel features of the interurban cars on that property. These cars have been described in issues of this paper. He also spoke of their noiseless features, including rope suspension for trolley bases and air compressors. Within the last two or three months, 28-in. wheels have been installed instead of 26-in. wheels to secure greater speed. The company is also experimenting with a magnetic track brake operated from the trolley circuit. It functions with the air brake and reduces the distance and time required to stop cars by at least 25 per cent. He believes the public ready to support with their patronage cars which operate on a fast schedule and are comfortable.

In conclusion, Mr. MacLeod gave some interesting figures on economies gained with the light one-man cars on the Buffalo & Erie Railway, as compared with two-man operation. The saving in total operating expenses in 1925 over 1924 was approximately 20.2 per cent, despite the fact that the car-miles were increased 16.7 per cent. By the use of one man instead of two a reduction of 60 cents an hour was obtained. Another saving was in power. The total power cost in 1925 was 3.3 cents per car-mile and the power consumption, excluding heating, was 2.02 kw.-hr. at the car. The

equipment maintenance was 1.1 cents per car-mile. On the Lexington property of the same company, after five years use of light-weight cars, this charge is still less than 1.8 cents. Finally, track construction and maintenance costs have been reduced by a wider spacing of ties, made possible by the lighter cars. In Lexington, where no freight trains are run, the spacing is 3½ ft. except at joint ties, as against the old spacing of 2 ft. On the Buffalo & Erie Railway, where a freight service is run, the spacing used is 3 ft. as against the 2½-ft. spacing previously employed.

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, said the initials of the words Electric Railway Operation also stand for Education Responsibility is Ours. He thought it especially the duty of railway managements to explain to city officials and the public the public need for good street railway service. Merchants also should be shown that most of their patrons come by electric car and not in private autos and taxis. A recent check on this subject was made at a large department store in Brooklyn. Between 8 a.m. and 6 p.m. 33,000 patrons visited this store. Of this number 4.8 per cent walked there, 8 per cent came in private automobiles or taxicabs, 2.2 per cent came from the station of the Long Island Railroad, 31.3 per cent came from the subway, 20.3 per cent were delivered by elevated railway and 33.4 per cent by surface railway. Mr. Morgan spoke of a Pittsburgh merchant who thought most of his patrons came in private autos and taxicabs. To prove to him that he was wrong the railway company early each morning for three days parked autos around his store and left them there all day. The sales increased. Mr. Morgan also quoted figures from a recent study made by the B.-M.T. Corporation on the comparative use of the streets by private automobiles and street cars.

The series of ten-minute talks on "New Kinks," by manufacturers' representatives, was initiated by Bertram Berry, Heywood Brothers & Wakefield Company, New York. Mr. Berry said, in part:

IMPROVEMENTS IN SEAT DESIGN

One of the more recent demands in passenger transportation is for greater comfort. Some years ago, with the advent of the single-truck safety car, many of the electric railways adopted wood slat seats for their city service because they weighed less and were more economical in first cost and maintenance than upholstered seats. As the cars ran on rails, a not uncomfortable ride was had, providing the roadbed was kept in proper condition.

When motor buses started to haul passengers, the old style of seating was found to be inadequate. Uneven street paving and the sudden starts and stops of the vehicle brought a call for deep, soft cushions and high-yielding backs. Electric railway managers, noting that the riding public appreciated and was attracted by comfortable seats, are giving the subject careful consideration. The seat manufacturers, in turn, have

been studying how to meet the new demand and have developed reversible seats with deep, well-upholstered cushions and thick backs with light springs.

Seats with sub-spring cushions and spring air cushion top pads with form-fitting backs, either revolving or stationary, have been designed. They can be provided with frames of wood, steel, reed or fiber. Usually an arm rest or panel is used at aisle end only. If the width of the car will permit, seats with an arm should be 37 or 38 in. over all. In buses, chairs with arms are frequently made only 35 in. long due to restrictions in the width of the bodies.

Single revolving wood and reed parlor car chairs with double springs can now be secured. Genuine leather is generally used in upholstering the deep cushion seats, although mohair plush is favored for parlor cars.

The appearance of the interior of a car depends largely on the seats. Recently the Eastern Massachusetts Street Railway, desiring to improve the appearance of some of its cars with the expenditure of little money, had the slat seats covered with an embossed imitation leather. Hair felt was used under the imitation leather. The effect was excellent, some of the regular patrons believing the management had provided new cars. Money invested in attractive furnishings and in adding to the comfort of electric cars will bring returns in the form of good will and increased patronage.

A. Frank Paul, National Pneumatic Company, Philadelphia, discussed progress in the development of circulation in passenger movement. An abstract appears elsewhere in this issue.

GIVES RECENT CAR STATISTICS

George Frey, the J. G. Brill Company, Philadelphia, referred to the report on cars recently compiled by the American Electric Railway Association and published in abstract in last week's issue of this paper. He urged all to read and study it. In commenting on it he said that records had recently been compiled showing cars ordered by electric railways from Jan. 1, 1926, to date, indicating a total number of 33 orders and 873 cars. Of this total 49 were single-truck city cars, 443 double-truck city cars, 80 heavy electric coaches and 301 for elevated and subway service. Of the 33 orders for cars mentioned, 21 orders, representing 289 cars, required new drawings. A further analysis of the 443 double-truck city cars ordered showed that 200 were in orders of 50 or more, and of the 243 remaining cars, 46 were represented by two orders. This left 197 cars on 21 orders, and these could have been uniform in all essential respects but were not. The speaker emphasized the desirability from the economic standpoint for companies ordering cars, especially the smaller companies placing small orders, of keeping to uniform dimensions.

Other statistics given by Mr. Frey relating to the city cars were as follows:

49 had 25-hp. motors
375 had 35-hp. motors
10 had 40-hp. motors

8 had 50-hp. motors
50 had 60-hp. motors

85 had plush seats
66 had leather seats
170 had cane seats
168 had wood seats

79 had rubber floor covering
49 had linoleum floor covering
367 had plain wood floor covering

12 had pressed steel trucks
74 had arch bar trucks
18 had built-up trucks
391 had solid trucks and of this number 191 car sets were maximum traction trucks

John F. Craig, Westinghouse Air Brake Company, New York, gave particulars of that company's latest type of variable load brake for surface cars. He pointed out its advantages in increasing the braking rate of loaded cars and in reducing the number of flat wheels.

This portion of the program concluded with a discussion by R. Krienberg, Electric Service Supplies Company, New York, who referred to the effect on car design and equipment of changes which added to the comfort of passengers. This is being evinced by more comfortable seats, better illumination, more attractive decoration, better destination and route signs, more efficient headlights, etc. Modern tendencies in car equipment, he said, are decidedly in this direction.

During the morning session, at the request of President Harvie, the delegates stood for a half-minute in silence in memory of J. E. Duffy, whose death occurred recently. Mr. Duffy was general superintendent of the New York State Railways, Syracuse.

A MESSAGE FROM THE WEST

The second session of the association was held in the evening of June 25 to permit the display of slides and moving pictures with two papers.

Mr. Harvie called the meeting to order about 9 p.m. and said that Myles Lambert, Westinghouse Electric & Manufacturing Company, had a "message from the West" to present.

Mr. Lambert said he had spent considerable time recently in the Central West and had received many inquiries there about the electric railway situation in New York, particularly in New York City. The New York papers had published statements that the substitution of buses for a number of important electric railway lines was being seriously considered in New York City. These rumors were having a very disturbing effect throughout the country. He urged the electric railway interests of New York State to see that the facts in the case should be made public through a bureau of public information and in other ways. He particularly urged co-operation in this matter with the interests in New York representing the security holders of properties elsewhere in the country.

Papers by Leon R. Brown, safety engineer New York State Railways, Rochester, on "Traffic Problems in Rochester," and by H. L. Andrews, General Electric Company, on "Electric Drive for Gasoline Buses" were presented. Both were illustrated by moving pictures. Abstracts of these

papers will be found in this and a subsequent issue. The views shown by Mr. Brown had been taken with the approval of the Commissioner of Public Safety, Chief of Police and captain of the Traffic Squad in Rochester and depict congested street conditions in Rochester, proper methods of making right and left-hand turns, violations of traffic rules, etc. They had been shown at a meeting for automobile drivers in Rochester under the auspices of the traffic committee of the Rochester Engineering Society. Later they will be exhibited at the theaters in that city.

ELECTION OF OFFICERS

The concluding portion of the session was devoted to the election of officers. The report of the nominating committee for officers for the ensuing year, presented by R. E. Danforth, was unanimously adopted. It was as follows:

President, William W. Foster, Rochester.

First vice-president, William G. Gove, Brooklyn.

Second vice-president, William E. Thompson, New York.

Third vice-president, Ernest Murphy, Albany.

Secretary-treasurer, William F. Stanton, Rochester.

Executive committee, the officers and Frank Hedley, New York; Harry B. Weatherwax, Albany; James F. Hamilton, Rochester, and Slaughter W. Huff, New York.

At the conclusion of the election, Mr. Foster and the other newly-elected officers who were at the meeting were installed in office.

LARGE ATTENDANCE AT BANQUET

The annual banquet was held Saturday evening. This gave opportunity to those in attendance to participate in golf and other outdoor sports on Saturday. A number of sightseeing trips by buses were also provided and were enjoyed by those who participated.

There were many ladies at the convention, as is usual at Bluff Point meetings, and special sightseeing trips, bridge parties, etc., were arranged for them while the delegates were in session. They also attended the banquet, which was one of the most enjoyable ever held by the association. Mr. Harvie acted as toastmaster. The two speeches scheduled were of high grade and were well received. Hon. T. W. Wilson, Congressman from Mississippi, spoke of ideals in life and showed that the modern conception of aristocracy in this country is the aristocracy of service. Rev. John L. Davis was the other speaker and won great applause by his humor.

Importance of Truthful Advertising by Public Utilities

POINTING out that public utility advertising should be at all times based upon unassailable facts, Louis Wiley, business manager of the New York Times, delivered a most illuminating talk on "Newspapers and Public Utilities" before the Public Utilities Advertising Association, at the conven-

tion of Associated Advertising Clubs of the World, held in Philadelphia, Pa., on Tuesday, June 22. He declared it to be one of the greatest problems of the public utilities to cultivate and maintain community good will toward their activities. Emphasizing the important part which the newspapers in the community may play in improving this good will through judicious advertising Mr. Wiley was emphatic in stating that it is better not to advertise at all than to advertise unintelligently. He went on to say:

Poorly conceived advertising will fail to bring you results and will hurt the reputation of this powerful business influence among you. Until you are convinced of what advertising will do for you; until you are ready to understand that what you say in your copy must be only the truthful reflection of your company's character and that advertising cannot conceal or atone for mistaken policies of management; until you have a definite goal to be achieved by taking space, I would advise you not to advertise.

Mr. Wiley took the attitude that proper advertising will have a very beneficial effect upon the attitude of public utility employees. The public utilities may learn something in this direction from the great department stores. In such stores the employees are required to know what the company has advertised in the daily papers,

both merchandising and institutional copy. The managers find that the employees take the keenest interest in the public advertising of the stores' policies and goods. Mr. Wiley believes that public utility advertising in the newspapers should be carefully prepared to have the right effect upon the employees as well as upon the public. He also pointed out the necessity for proper discrimination in the use of copy. Public utilities as well as merchandising institutions must deal with widely differing classes of patrons and the taste and characteristics of these various types must be carefully analyzed before a successful advertising program may be carried out.

Mr. Wiley looks for the greatest advance in public utility advertising in the future in the institutional form of copy. He said:

See to it that your institutional advertising is scrupulously honest with the public; and if it is not backed up by performance it will be in vain. The most pious protestations in advertising in the world may be just as untruthful as the cheap copy which intelligent persons can tell at a glance is false. I cannot think of anything so vital to a public utility, whose prosperity must be bound up with the persons in the community it serves, as public confidence. Advertising alone will not begot this confidence, but truth in advertising will.

now pass to a consideration of the subject in this relation.

In a one-man car everything possible must be done to help the operator and to increase car mileage. The safety devices equipment was designed especially to facilitate the work of the one-man car operator. This was comparatively simple on the original Birney car, which had only one passageway for loading and unloading. But as larger cars came into use in one-man operation, on lines of heavier traffic, the duties of the operator increased proportionately. It then became evident that some additional facilities were necessary, so the longer platform car having a separate entrance and exit door, side by side at the front right-hand corner, was introduced and found of decided advantage. Simultaneous loading and unloading resulted.

With the front-entrance front-exit type of car the difficulties of aisle friction (passenger movement in opposite directions in the aisle), congestion at the pay point (passengers unwilling to move away from close proximity to the exit doors) and street friction (passengers massed at the entrance on the street, delaying the egress of passengers) immediately were evident and offset largely the advantage gained by the two doorways.

Perhaps the next step in the development was the turnstile type of circulating load car, in which the passengers board at the rear and leave at the front. This car has been operating very successfully in a number of cities. In others the turnstiles have been abandoned, the cars being operated as front-entrance rear-exit without turnstiles. A number of cities operate cars in which the passengers either enter at the rear and leave at the front, or vice versa. Among them are Albany, Scranton, Altoona, Knoxville, Fairmont, Springfield (Ohio) and Dayton. While this type of car is an advantage over the other types mentioned, it is not all that could be desired. The treadle rear exit supplies the need.

With a front-entrance rear-exit treadle type of car all of the difficulties in the movement of the passengers are eliminated. There is no street friction, no aisle friction, no congestion around the pay point, no hesitation on the part of the passengers to move away from the entrance door, as they are naturally anxious to move toward the exit door so as to alight more quickly at their destination. There is no street friction, because the passengers getting out do not encounter any of the boarding passengers. A description of the operation of this car will illustrate the advantages.

In the operation of a one-man car the car operator is both the motorman and the conductor, but these two duties are entirely separate and distinct. While the car is in motion the operator is a motorman, looking ahead and having his hands on the controller and brake. Coming to a stop where there are passengers to board, he applies his brakes and opens the front door. He is then finished as a motorman and assumes the duties of conductor. He collects all fares, makes change, issues transfers, answers questions, assists passengers

The Circulating Load in Passenger Movement*

Though Not New in Idea, This Principle Has Received Great Impetus Recently Through the Use of Large One-Man Cars—Possibilities Along This Line

By A. FRANK PAUL

National Pneumatic Company, Philadelphia

THIS is not a new system in car operation, but the phrase sounds new to us in that it has been recently popularized through the extension of one-man car operation, on larger car units, such as the turnstile car, the treadle car and the double-truck one-man car, where the passengers enter at the front and leave at the rear or vice versa. So many of us have come to think of it as a new scheme of operation. Nevertheless, the original "pay-as-you-enter" and "pay-within" types of car were fundamentally circulating load cars. When the "pay-within" car was introduced we endeavored to persuade the railway operators to insist that the public follow this method, but were unable to do so, because the officials felt that such a hard and fast rule would create more unpopular feeling and dissension than it would do good. The "pay-within" car had a chain across the rear exit, which the conductors were instructed to unfasten only in extreme cases, when the car was crowded during rush hours. Otherwise, there would be a delay if passengers had to force their way through crowded aisles to exit at the front. Another type of circulating load car is the Peter Witt "pay as you pass."

There is certainly much to be gained

by an orderly systematized method of passenger movement, in comparison with the haphazard plan which results in a tangled knot of people trying to get through a small aperture at one time, and in many cases obstructing the flow of another group of people coming in the opposite direction.

In England, at all heavy loading points, the passengers are arranged in systems of queues. There are two lines to the queue as the platforms of the car have two passageways, one to the upper deck and one to the lower deck. In this way cars holding 74 to 76 passengers are loaded in an astonishingly short time. One car which we timed with a stop watch loaded in 45 seconds, and the average of a number of cars was 55 seconds. American managers say that the American public will not stand for this scheme. However, it was used to a considerable extent during the war, and is still in operation in some places. Personally, I believe that this system could be applied to the elevated and subways of our large cities to great advantage, especially where there are railings on the platforms to control the passenger movement, and the cars are stopped with the doors in front of the openings in these railings.

As stated, the phrase "circulating load in passenger movement" is thought of in connection with the more recent double-truck one-man cars. We shall

*Abstract of paper at annual meeting of New York Electric Railway Association, Bluff Point, N. Y., June 25, 1926.

and does the complete work of a conductor. When this is finished, he turns to the brake and controller, having in the meantime had no thought or consideration for the passengers who may have been exiting from the car. These are leaving through the automatic treadle door at the rear. Having resumed the duties of motorman, he looks in the signal light to see whether the automatic conductor on the rear has closed the rear door, as he would do on a two-man car. As soon as he gets the signal light that the rear door is closed he releases his brakes and proceeds.

The great advantage of this system is that the two functions of the man can be so clearly and completely defined and his mind is so entirely relieved of anxiety and concern for what may be going on at the rear of the car. The rear treadle is interlocked with the brakes, so that should the motorman become careless or neglectful, he could not start the car when any one was on the treadle or the step. Further, he could not close the door on a passenger who was alighting at the rear.

There are at the present time 1,165 treadle cars in operation, with 225 additional on order. The city of Toronto has been operating for the past year 10,000 car-miles per day, at an average

speed of slightly more than 10 m.p.h., with large double-truck treadle cars. These cars have such a capacity that frequently during rush hours from 100 to 120 passengers are on the car. Further, these cars are running on the same track through the down-town congested district with "pay-within" type two-man cars and Peter Witt two-man cars. They are able to keep their place in the schedule without holding up or delaying the two-man cars. Stop watch tests have shown that the treadle car in Toronto is the fastest unloading car in the city, it being faster than the Peter Witt two-man car. It is not quite as fast in loading, but the gain in unloading has offset this and enables it to make a schedule speed of slightly better than 10 m.p.h.

In every case where the treadle car has been thoroughly tried out it has been proved beyond doubt that larger loads can be carried and faster time maintained than with any other type of one-man car. Lines are being operated by the treadle car which previously were considered too heavy for one-man operation.

Illustrating the extent to which the treadle car has gained favor, to date this year 498 city service cars have been purchased. Of these 278, or 56 per cent, are treadle cars.

accepted a franchise for an extension through an old but unpaved street in Queens County connecting with one of its lines in Brooklyn. As a condition of the franchise the company paved the railroad area. That street has since become one of the main through thoroughfares, particularly for trucks, but the space outside the railroad area is still unpaved. In consequence, the movement of trolley cars is impeded at times by the public's use of the facility which the railroad company has provided. The pavement is of no benefit to the company; rather the reverse, but it paid the bill. Another case is that of a company which also operated in Queens County, but now has gone out of business, where the paving bills rendered by the city authorities for one year were in excess of 60 per cent of the entire year's gross receipts. Still a third case is that of another company, also operating in Queens County and now in receivership, where operation is continued solely as the result of a tacit agreement by the present administration not to press for payment paving bills amounting to more than \$200,000.

In many instances local authorities will direct the substitution of new and more costly pavements for an existing one not in need of general repair. Where that occurs in a street occupied by a double-track street surface railway it generally means that a large part of the cost, sometimes as much as two-thirds of the total, must be paid by the company and the remainder borne by the municipality at large as a part of its general tax levy. Thus, the street railway company must pay not only the bills directly rendered to it for paving the street railway area but also its share of the general charge as a real estate owner and taxpayer.

With the ever-growing increase in vehicular traffic on the streets, there is no reason why the street railway, which is responsible for less wear and tear on the street pavement than other users, should be singled out for a continuance of the old horse car time obligation. Theoretically, a special tax is premised only upon a special benefit or privilege. Destroy or remove the benefit and the tax should fall. Certainly, in any comprehensive readjustment of the tax burdens and imposts throughout the state, provision should be made for the entire elimination or amelioration of the existing paving obligation.

IMPROVEMENT SLOW

With accumulation of state and local taxes upon these public utilities—gross earnings taxes, excess dividend taxes, corporate franchise taxes, special franchise taxes, real estate taxes, percentage payments and car license fees—and with the insufferable paving burden on top of them all, naturally the question arises: What can be done about it? The somewhat indefinite program of the Legislature's committee four years ago contemplated a constitutional amendment as a necessary preliminary to getting rid of the special franchise tax. As yet, not a single constructive step for the correction of the outrageous tax conditions affecting public utilities generally, and this industry in

Tax Problems in New York State*

Injustice of Many Existing Burdens Admitted—Progress Toward Their Removal

BY RALPH NORTON

Of Counsel to Interborough Rapid Transit Company

"THE present taxes on public utilities are a complicated hodge-podge which are the despair of the taxpayer and an occasion for amazement and scorn of students of taxation generally. For a long time it has been generally appreciated that the taxes on public utilities were arbitrary, uncertain and complicated, but it has been assumed that the law did achieve a reasonable degree of equity in the distribution of the tax burden. Our statistical investigation shows conclusively that the net result of all the effort which we now put forth in assessing these intricate taxes is scandalous inequality and disgraceful discrimination."

These are not my words. They constitute the indictment found by the Davenport joint legislative committee in 1922 against the statutory provisions under which different classes of public utility corporations are taxed for the support of municipal and state governments. The statistical tables accompanying the committee report furnish ample justification for the conclusion that gross inequality and discrimination prevail. The committee found that public utilities as a group pay a larger percentage of their net income in taxes than any other class of corporations doing business in the state, and that within the public utility group the

street railway industry had to bear a burden nearly 100 per cent greater than other members of the group.

For a ten-year period, from 1911 to 1920, inclusive, the Davenport committee found that telephone and telegraph companies paid 16 per cent of their net income in taxes, gas and electric companies 23 per cent, steam railroads 27 per cent and electric railways 44 per cent. The comparison is all the more unfavorable to the street railroads because of the fact that the other public utilities have been able to raise their rates to meet their increased expenses. Undoubtedly, if the period under examination had been extended to later years the discrepancy would have been even grater. If any consideration had been given in the report to the paving obligation and its effect upon street railway finances the resulting discrimination and inequity would have been much more striking.

PAVING OBLIGATION UNJUST

The paving burden had its beginning in the horse car times, but under present-day conditions the obligation is as obsolete as the horse car itself, and it has been distorted by municipal authorities to cover requirements which, while they may come within the technical language of some particular franchise, were never within the contemplation of the parties at the time the contract was made.

In one case, the B.-M. T. system

*Abstract of paper at annual meeting of New York Electric Railway Association, Bluff Point, N. Y., June 25, 1926.

particular, has been taken. Committee bills have been introduced from time to time since the 1922 report, notably those paving the way for the constitutional amendment incidental to the effort to get rid of the special franchise tax, but they get nowhere. Only this year the special joint committee on taxation and retrenchment reaffirmed its 1922 recommendation "that the taxation of public utilities be completely revised." But nothing is done.

If anything in the way for betterment is to be accomplished it must be germinated, nourished and brought to full and vigorous fruitage by the untiring efforts of those most vitally concerned. That means us.

For a number of years this association, functioning through its executive committee, has been making every effort to secure from successive legislatures the passage of a remedial measure which would substantially reduce the paving bills of street railroad companies by limiting the area to which the obligation would attach, and by clearly defining the proposition that the obligation is one to repair and not to repave, as the changing desires of the people or city administration might dictate. A measure of this character, cutting down the obligation rather than one seeking to remove it entirely, was considered wiser from a practical point of view because of the solidified opposition of the cities throughout the state which a bill entirely eliminating the obligation would be sure to bring forth. The wisdom of that course seems to have been amply justified by the progress which the Stevens-Thayer bill made at the 1926 session of the Legislature, drafted by and introduced at the request of this association's executive committee.

This bill proposed to amend Section 178 of the railroad law, which creates the paving obligation, so as to limit the street railroad area to what might be called ribbons of the street surface 16 in. in width with a rail in the center of each ribbon, and also by clearly specifying the street railway company's obligation to be one of maintenance and of restoration to the former condition of any part of the pavement of such street which should become in need of repair in consequence of the existence or use of the track. This bill was favorably reported in both houses and seemingly encountered little real objection. It probably would have passed if it had not been caught in the jam of the concluding days of the recently ended legislative session.

The successful culmination of such an effort would bring New York in line with Massachusetts, Connecticut, California and Montana, where similar drastic paving requirements to those now on our statute books have been modified. In addition, in many cities, scattered through 24 states, individual relief has been granted to different railway companies, varying between complete exemption from original paving, repaving and maintenance costs, requirement of only part of the cost of original paving and agreements stipulating annual flat amounts to take the place of all paving requirements.

In some cases the relief granted is of a temporary nature, in others agreement for a specific number of years, and in many others it is permanent. It will thus be seen that a measure such as that which this association has sponsored, and which it will again present and urge for passage, is in line with a widespread attitude of fair treatment of this subject by different sovereign states and by many municipalities.

FRANCHISE TAXES

This year the executive committee of the association determined for the first time to seek some other form of legislative relief from existing tax burdens in addition to the paving bill. After mature consideration, it was felt that the objective most likely to be obtained would be found in some amendment of the statutory provisions under which the corporate franchise taxes payable to the state are assessed. Accordingly, the committee caused to be introduced, in the 1926 Legislature, a bill attempting to do away with some of the discrimination which had been found to exist between different members of the public utility group. That bill, known as the Smith-Mastick bill, proposed to reduce the percentage of the gross earnings which operating street railroads are required to pay to the state as an annual franchise tax from 1 per cent to one-half of 1 per cent, and thereby place the street railways on a parity with steam railroads and certain other public utilities. To remove objections of the State Tax Department, the bill was changed so that the franchise tax would be a varying percentage of the capital stock of the company affected according to its degree of prosperity, as evidenced by dividends paid. With this amendment passage of the bill seemed assured until the closing

days of the session, when it ran into the same situation which prevented the passage of the paving bill, although there was an additional consideration about the make-up of the state's financial budget, which would have been slightly affected had this bill become a law.

I feel sure that the amounts which the companies would be required to pay to the state under the law as it is proposed to be amended would be a smaller proportion of their gross receipts than they are now paying.

WHAT CAN THE ASSOCIATION DO?

What can the association do, and what can its members do? They can see to it that their representatives in the Senate and Assembly are acquainted in a general way with the injustice and discrimination affecting street railroads under the existing law. They can call to the attention of those representatives the fact that bills to correct some of those inequalities and discriminations were introduced at the last session of the Legislature, and that similar bills undoubtedly will be introduced early in the 1927 session. They can enlist the support of such representatives to those measures when introduced.

In this respect ours should be a campaign of education, because we cannot close our eyes to the fact that measures such as these have no popular appeal and that their successful passage can be accomplished only by obtaining the intelligent interest of the members of the Legislature. That means being sure that the legislators learn what the bills are all about. That job is ours, and we should bend every effort to see to it that between now and Jan. 1, 1927, the necessary knowledge is imparted.

Some Legal Phases of Street Railway and Bus Operation*

Conditions Under Which Railways May Undertake Bus Service—Methods of Combating Installation of Competing Bus Lines—Control of Interstate Lines

BY ALFRED T. DAVISON

General Counsel Third Avenue Railway, New York City

MOST of the bus operation which has been initiated during the last five years in the city of New York and the territory immediately adjacent thereto is illegal and the buses involved in such operation are legal nuisances on the street. Probably the same situation to a lesser extent exists in other localities throughout the state.

Formerly the Public Service Commission, then as now empowered by statute to invoke the most summary processes known to the law—injunction and mandamus—was zealous in preventing the carrying on of a transportation business as common carriers by persons and corporations not legally empowered so to do. During the last few years the

Public Service Commission and the Transit Commission, because of the increase of their own pressing duties and business and the prevalence of this illegal operation, have been unable to take the necessary steps to stop such illegal operation. If, therefore, this illegal operation is to be stopped the institution of legal proceedings to that end will largely, if not entirely, devolve upon street railways. Moreover, many street railways are finding it to their advantage to engage in bus operation in co-ordination with or as an auxiliary to their street car lines.

Within the limitations of the time which can now be given to this subject I shall discuss: (1) Requirements for the legal operation of buses; (2) legal proceedings and methods by which the establishment of legal bus operation may be opposed and defeated; (3) ille-

*Abstract of a paper presented before the New York State Electric Railway Association, Hotel Champlain, Bluff Point, N. Y., June 25, 1926.

gal bus operation and its effects and prevention; (4) interstate bus operation.

REQUIREMENTS FOR THE LEGAL OPERATION OF BUSES

Here we find that street railways are in a class by themselves. By Chapter 840 of the Laws of 1926 a new section known as Section 50-a was added to the public service commission law whereby the commission may authorize the substitution of buses or motor vehicles in place of cars or trains upon tracks on any portion of a street railway route, provided the municipal authorities of the city, village or town consent.

Assuming such consent the following are some of the legal corollaries or deductions resulting:

Compliance with the new section 50-a is the only method by which a street railway may directly operate buses. A street railway company can of course operate buses indirectly through the organization and stock ownership of an operating bus company or companies with the consent of the commission.

The order of the commission and the consent of the municipality for the substitution of buses for street cars can be so drawn as to authorize the use of buses for a limited period, with the privilege of resuming operation by street cars at the option of the street railway. Likewise the order and consent can be so drawn as to make it possible to operate street cars during part of the day and buses during the balance.

So long as the tracks remain in the street the paving obligations of the street railway will not be changed, but if the tracks are removed, then the street railway will be relieved of its paving obligation. This is true both under the paving obligation imposed by the railroad law and under the usual paving obligation sometimes embodied in franchise contracts. Our experience has been that unless the Public Service Commission requires as a condition of the abandonment an agreement on the part of the railway to remove the tracks and restore the pavement, the tracks can be removed at the same time the city repaves the street.

The obligation of snow removal is contained in the railroad law and is also sometimes embodied in franchise contracts. It is doubtful whether the following clause contained in Section 178 of the railroad law,

and such authorities may make such reasonable regulations and ordinances as to the rate of speed, mode and use of tracks and removal of ice and snow as the necessity or convenience of the public may require,

is authority for the adoption of an ordinance requiring a street railway company which no longer has any tracks in the street and operates buses still to keep a given area free from ice and snow.

The street railway will still be required to pay the per cent of gross receipts called for by its franchise. If the tracks are removed the company is to that extent relieved from paying special franchise taxes.

We come now to the operation of buses by persons and corporations other

than street railways. As stated above, a street railway can indirectly carry on bus operation by stock ownership of separate corporations. Buses can be operated by an individual or by a corporation, but if by the latter such corporation must, if formed after April, 1921, be incorporated under the transportation corporations law.

In villages and towns which have not accepted the provisions of Section 26 of the transportation corporations law buses may be operated without any franchise and without any certificate of convenience and necessity. One advantage of the operation by a corporation in towns and villages which have not made Section 26 of the railroad law applicable is that if after bus operation is commenced by a corporation organized under the transportation corporations law such village or town adopts a resolution making Section 26 applicable, nevertheless the corporation already operating buses has, I believe, a franchise right which is not affected by the subsequent adoption of such resolution. Until the adoption of such a resolution no bus operation in such villages and towns can be prevented, nor is any such bus operation subject to the jurisdiction of the Public Service Commission.

In all cities and in those towns and villages which have adopted the provisions of Section 26 no bus operation can legally be carried on unless (1) the consent of the local authorities of such city, village or town and (2) the certificate of convenience and necessity from the Public Service Commission have been obtained. The above requirements follow from Sections 24, 25 and 26 of the transportation corporations law. They must be met for all buses irrespective of the rate of fare charged and whether or not passengers are taken on or discharged between termini.

The transportation corporations law was amended generally by Chapter 762 of the Laws of 1926. The changes on the above provisions are with respect to numbering of sections only.

There is no distinction between a consent under Section 26 of the transportation corporations law and a franchise. A franchise, broadly speaking, is the privilege to do something which the public is generally not permitted to do. The right to operate a street railroad is always referred to as a franchise and yet the railroad law requires "the consent of the local authorities having control of that portion of a street or highway upon which it is proposed to build or operate such railroad." In other words, "consent" and "franchise" are synonymous.

When a franchise is granted by a city, the charter provisions of that particular city as well as provisions of the general city law and the second class cities law, in so far as applicable thereto, must be complied with.

In cities of the second class every franchise, and this includes a bus franchise, must be sold at public auction. The general city law, which relates to all cities not of the first or second class, also contains a provision requiring the

sale of franchises at public auction, but this limitation only relates to those cities where the only power to grant the franchise comes from the general city law.

The procedure for the granting of certificates of convenience and necessity is familiar and no attempt will be made to outline the general principles except to say that in some states public utility commissions have preferred the operation of buses by existing transportation companies rather than by new transportation operators.

OPPOSING THE ESTABLISHMENT OF COMPETING BUS OPERATION

Assuming that a franchise has been granted, then the only method of preventing bus operation is the successful contesting of the granting of the certificate of convenience and necessity by the Public Service Commission or the Transit Commission. Obviously if the bus operation competes with an existing street railway operation the certificate of convenience and necessity should not be granted, nor should it be if the financial ability of the grantee of the franchise is not sufficient to insure the proper institution of bus operation. Therefore, in opposing the granting of the certificate of convenience and necessity, all facts which come under any of these heads should be fully brought out in the hearings before the Public Service Commission. One thing is certain, our commission, and in fact all public utility commissions, have repeatedly held that they will not permit a duplication of, or competition in, public utilities. The right of the state to regulate public utility companies is based upon the proposition that a public utility is a monopoly and must be protected. The basic theory upon which a certificate of convenience and necessity is required is that there shall not be competition or duplication of transportation facilities. We so often hear public officials thoughtlessly advocating competition in transportation facilities that no effort should be spared to show to the public and to official bodies not only the impossibility of competition but that competition of public utilities is diametrically opposed to regulation and control.

Assuming, however, that the Public Service Commission grants a certificate of convenience and necessity, then the only remaining step which can be taken in opposing such bus operation is by a *certiorari* proceeding in the Supreme Court. Such *certiorari* proceedings are in the nature of an appeal from the Public Service Commission and the determination thereof is based entirely upon the record before that body. While the court will not arbitrarily substitute its own judgment for the judgment of a commission, nevertheless it will set aside the granting of a certificate where it is clearly shown by a preponderance of evidence that its granting was not justified.

From this it will be seen that it is most important that in the proceedings before the Public Service Commission the case be most carefully prepared and that the record contain evidence of all facts which in any way tend to show

that a certificate should not be granted.

The Public Service Commission is given power to invoke the summary process of the court by injunction and mandamus to prevent any illegal transportation operation. In the last few years, however, it has been very definitely established by the courts that illegal bus operation may be enjoined by street surface railroads.

There never has been any question concerning the right or power of a street railroad corporation to enjoin illegal bus operation, which competes with street railroad operation, and naturally the street surface railroad company is in a better position to show competition with its existing transportation lines than even the Public Service Commission would be. Personally, I believe that every additional means of transportation competes with all existing means of transportation, irrespective of the fares charged.

We have found in the prosecution of these injunction actions against illegal bus operation that the claim has been made, on behalf of the illegal bus operators, and even by municipalities, that the street railway had no standing to invoke the protection of a Court of Equity by means of injunction for the reason that the railway could not actually show that it was in any way damaged by such illegal bus operation.

The Appellate Division, Second Department, in *Huff vs. City of New York*, 202 App. Div., 425, has squarely held that:

The action may be maintained by a common carrier of passengers with whom the bus lines come in competition, or by a taxpayer for injunction to restrain an illegal official act, and to obtain a judgment for loss to the city occasioned by such an illegal act of the officials, or by any citizen and resident of the city to secure the abandonment of a nuisance in the public streets.

Inasmuch as it has been held that a street railroad is a resident and citizen of every municipality in which it operates, it follows that a street railroad company can bring an action for injunction as a resident and citizen.

In a recent case by the Westchester Electric Railroad vs. Mount Vernon Sight-Seeing Company, Inc., Mr. Justice Taylor sustained the right of the railroad company to enjoin illegal bus operation without passing upon the question as to whether the illegal bus operation was in competition with the street surface railroad.

In the last few years we have brought upward of fifteen actions to enjoin illegal bus operations and have secured the injunction in each and every case. There is, therefore, little excuse for a street railroad permitting illegal bus operation in its territory.

Apart from the question of competition, street railways are very materially affected by illegal bus operation in that bus operation adds to the vehicular congestion of the street and, therefore, increases the danger of collisions with such vehicles.

INTERSTATE BUS OPERATION

The operation of buses from one state to another is increasing rapidly and presents an interesting question under the interstate commerce clause of the Constitution of the United States. The

courts have not yet definitely passed upon the right of an interstate bus to operate in a state without securing a franchise required by the laws of that state for bus operation in its public streets, but the recent decision of the United States Supreme Court in the *Buck* case should be considered. The court decided that an injunction should issue enjoining any state official from prohibiting such interstate operation. This decision, however, was made on the ground that the primary purpose of the Washington statute requiring a certificate of convenience and necessity was not regulation with a view to safety or the conservation of the highways, but was for the purpose of the prohibition of competition. In that case the statutes of Washington did not require, as do the statutes in New York, that operators of motor buses as common carriers must obtain a franchise from an agent of the state, namely, a municipality.

Until Congress passes a law assert-

ing its authority to regulate interstate commerce of buses it seems certain that a state may conserve its highways, even against interstate buses, by requiring, as a condition precedent to such operation, a franchise grant for such use of its streets.

Congress has been considering the passage of a law with reference to interstate bus operation, and hearings on interstate bus and truck operation are to be held during the coming summer before the Interstate Commerce Commission. I believe it is important that both the municipalities and the street railway industry of this and other states should be represented at those hearings and endeavor to have incorporated in that law a provision whereby no interstate bus operation can be carried on in those states which require franchises for intrastate bus operation unless franchises are also obtained for interstate bus operation. Such a provision will certainly settle any question which now exists on that point.

Traffic Problems*

Street Congestion Is Becoming Constantly More Serious—Suggestions Made for Its Relief and for Reducing Parking

By LEON R. BROWN

Safety Engineer New York State Railways, Rochester

THE public should be told of the importance of the street car; that today cars carry the bulk of the traffic on the streets; that the street car is the safest means of transportation on our streets today; that they occupy less area of the streets per passenger than any other transportation agency, and that no other means of transportation can approach the street car in the matter of low cost. Consequently the street car is here to stay for a great many years. We of the industry know that it cannot be replaced for mass transportation by the bus and that the sooner we convince the public of this fact the better it will be for every one.

When we tell the exact figures to the public they are astounded. In Rochester we made surveys during the rush hours and found that on Main Street 85 per cent of the riders were on street cars. The other 15 per cent riding in autos included the drivers. Similar percentages have been found to obtain in other cities. But none know it but ourselves.

The Safety Council in Rochester has about 100 bulletins on the streets containing safety slogans for autoists which they change each month. I asked the council recently if it would consider some slogans that would benefit car riders. I received little encouragement until I mentioned the fact that 85 per cent of the riders on our streets were street car riders. It was these people, while trying to get on and off cars, who were struck by autoists violating city ordinances, and this made up a sizable percentage of the killed and injured. As a result, the council at a recent meeting voted to use these slogans.

*Abstract of a paper at the annual meeting of the New York Electric Railway Association, Bluff Point, N. Y., June 25, 1926.

We should also educate the public regarding the traffic laws affecting the operation of automobiles in respect to street cars. Our police officials say that most of our traffic violations are due to the ignorance of drivers. These violations by motorists cause our accident lists to mount and slow up our service, thus discouraging our patrons and reducing our revenues. The motorist should be told that the street car has the right of way on the street or between cross streets (if that is the case in the city where you operate); that he must respect the rights of pedestrians about to board or alight from street cars; that he must not park opposite car stops, etc. Also, we can help shape the traffic laws in our cities, especially as pertains to the movement of funerals and parades.

HELP SOLVE TRAFFIC PROBLEMS

Traffic problems every day are becoming more acute. City officials and police, in most cities, are groping for possible solutions. We should help them to see clearly the relative importance of the various kinds of traffic and aid them in the solutions of their problems, thereby helping to solve our own problems.

We are fast approaching a point where there must be a restriction of traffic. In a recent issue of the *Industrial Digest* the results were given of a nationwide prize essay contest. The judges in this contest were all men high up in national highway safety affairs, such as general manager of the American Automobile Association, vice-president of the National Safety Council and a chairman of one of the national committees on Street and Highway Safety. It is worthy of note that both first and second prizes in this contest were awarded to contributors who pre-

sented practically the same general ideas—that of the restriction of vehicles permitted to enter the most congested traffic areas. For the benefit of those who have not read the prize-winning essay and to give you an idea as to what the thinking public is thinking I want to read to you a portion of this essay. This plaint for the relief of traffic congestion is based on the following underlying principles by Howard Williams:

1. Public highways are for the use of all people, on which they have the right to travel freely.

2. They were designed primarily for the use of pedestrians and for the conveyance of goods.

3. That while private vehicles have the right to move on the streets, that right is subject to the superior right of pedestrians and public vehicles.

4. That when traffic becomes too congested and the public welfare thus diminished, the use of private vehicles ceases to be a right and becomes a privilege which must yield to the superior right.

If traffic congestion in large cities must be relieved, without resort to major surgical operations, such as the widening of existing streets and the demolition of buildings to make new avenues, it logically follows that traffic itself must be reduced and controlled in a way that will work out to the best public advantage. This can be done only by:

- (a) The selective elimination of privileged vehicles from congested areas during certain hours.

- (b) The rigid control of necessary vehicles operating in those areas.

Private passenger conveyances and certain classes of commercial vehicles certainly belong in the privileged category. For private exclusive advantage they occupy traffic space which is now desperately needed for more general public use and thus infringe on public right to a free flow of traffic. Public conveyances—trolley cars, buses and taxicabs—just as surely belong in the category of necessary vehicles. They offer varied types of conveyance—traffic available to all people and to the exclusion of none. It is therefore proposed that:

1. All private passenger conveyances be excluded from defined congested areas during designated hours.

2. All commercial vehicles be classified and their operation in the restricted areas be regulated to meet the need and conditions of their particular classification.

3. All public passenger conveyances shall have free access to the restricted areas at all times, but shall be under rigid control, especially as it relates to the cruising and parking of taxicabs.

The advantages are obvious and many:

- (a) Elimination of private cars reduces congestion immediately and flow of traffic is consequently accelerated.

- (b) Freedom from parked automobiles leaves the curb lanes open for quick discharge of bus and taxi passengers.

- (c) There is more space in side streets, both for traffic and for taxicab stations, where waiting cars would be instantly available.

- (d) Owners of private cars, whose present progress in traffic is tedious and inconvenient, would find the loss of their privileges outweighed by increased speed, release from parking worries and accident responsibility.

- (e) Retail stores, instead of losing so-called "carriage trade," would find business stimulated by the greater ease and celerity of vehicular travel.

- (f) The constant demand for taxicabs and the rapid turnover resulting in that business would lead to finer cabs and to lower fares. Increased use of taxis does not necessarily mean a great increase in their number.

- (g) Routes connecting important city divisions and leading to bridges, ferries and tunnels would still be open to through traffic on avenues outside the restricted area.

- (h) The regulation and partial exclusion of commercial trucks would also reduce the danger factor during hours of busiest traffic.

- (i) The advantage to the pedestrian in great comfort and safety are too apparent to need elaboration.

If such an experiment were tried and proved successful it could be applied to other selected areas with acceptable modifications.

There are no physical reasons why such a plan could not be put into immediate ef-

fect. Existing traffic regulations can be easily altered to fit the new conditions if necessary. Present plans for the extension of traffic towers will not be affected. It involves no changes in curbs or road surface.

EFFICIENCY OF THE STREET CAR

If it comes to a question of the selective restriction of vehicles, the street car can easily be proved to be the most efficient means of transportation, in so far as street area used per passenger is concerned. Taxicabs are the least efficient of any vehicle. Investigations made at various locations in New York City indicate that there are only 0.83 of a passenger in each cab. Nearly half the cabs were cruising without passengers. It is estimated that a taxicab occupied about 64 ft. of street area, so that the amount of space required for each taxicab passenger is 80 sq.ft.

Surveys made in many cities of the United States and involving a total of nearly a million private automobiles indicate that the average number of passengers in each automobile, including the driver, is 1.75. This means that the private automobile requires about 30 sq.ft. of street area for each passenger.

The average bus will accommodate about 25 people. Assuming that they carry half a load at all times, this would mean about 20 sq.ft. of street area required for each passenger as compared to 30 used by the private automobile. If used to replace the private automobile entirely, they would greatly increase the passenger carrying capacity of our streets.

Surveys made of the relative efficiency of the various modes of transportation place the street car far in advance of the others. Figures show that with a full load it requires less than 4 sq.ft. of space per passenger. Thus it is twenty times more efficient than the taxicab, eight times more efficient than the private automobile and five times more efficient than the bus. We should tell the public about this.

Our traffic problem and our parking problem have done one thing beneficial to the railways, and that is, called attention to the unjust paving charges which the railway companies have to pay. Parking and congestion force traffic onto the car tracks. If vehicular traffic won't keep off the pavement which the railway company pays for and maintains, then they should pay their share of the expense, which is really the entire cost, because the street cars do not use the pavement at all, but operate on their own rails.

PERCENTAGE OF AUTOS USING LEGAL WIDTH

Actual counts taken on various width streets in Rochester where there are car tracks showed the following results:

On one street where the width between curbs was 40 ft., out of a total of 4,579 vehicles using the street from 6 a.m. to 6 p.m. 4,259, or 93 per cent, had one or more wheels on the railway company's legal width. On another street, which was 60 ft. between curbs, 38 per cent had one or more wheels on the legal width. This check was made in 1922.

Another check made on the same 60-ft. width strip—the check made on June 4 of this year—showed 93 vehicles out of 100 using the legal width. This was because the pavement in the car tracks was much better than the pavement outside the car tracks. As an experiment, the following day we had the police place a white strip defining a clearance line about 2 ft. from the rail from one safety loading zone to another. This reversed the ratio of autos using the legal width, only eight out of 100 going on the car tracks.

The street cars, while not actually using the pavement, occupy some of the area. Just what space they did take up I figured out for Main Street, Rochester, over which most of the car lines run. During the rush hour there is a car every few seconds. But computations show that during that time in a half mile of its most congested section the street cars occupy only 5 per cent of the paved area, while they pay for and maintain about 35 per cent of the pavement. On many of the streets the railway pays for more than 50 per cent of the pavement.

THE PARKING EVILS

The use of our streets for private garages affects the street railway in many ways. It narrows the effective width of the street, forcing other autos onto the car tracks, delaying traffic. Slow car service means more autos and still more congestion, because people want to get where they are going quickly. Parked autos increase the dangers of traffic. They make blind corners everywhere. A large percentage of our street accidents, especially collisions with pedestrians, are caused by the partially obscured vision due to parked autos. Now parking is of no benefit to any one.

As mentioned earlier, 90 per cent of the shoppers travel by street car. Anything to facilitate street car traffic helps the merchant. Where there is ten-minute, thirty-minute or one-hour parking in front of a store auto users cannot find a place to alight, and consequently get the habit of shopping at their neighborhood stores. This has been proved in Pittsburgh and elsewhere, where prohibition of parking in the congested districts aided business rather than injured it. This same prohibition of parking in the congested districts of Pittsburgh decreased the running time of all street cars—some as much as five minutes.

A prominent merchant of a large Eastern city recently said: "If merchants do not do something to relieve the present traffic situation within fifteen years there will be no down-town shopping districts of any importance." This fact is being recognized everywhere, and if brought about will mean a further falling off of street railway revenues.

The street railway and the merchants are in the same boat, so to speak, on this proposition and they should get together in remedying the situation. That the merchants have given little thought to the problem is shown by the fact that in a reply to a questionnaire sent out by the United States Department of Commerce to merchants throughout the United States

3 per cent of the merchants gave the street car as one of the causes of traffic congestion, whereas we know that the street car in transporting people uses a minimum amount of street area, and it therefore remains the chief solution to our traffic congestion problems.

Automobilists deceive themselves if they think they are saving money by parking in the street. Just the cost of a paint job is equivalent to a year's car fare, and a new coat of paint would certainly be needed on a car parked in the street all day for a few months. Simply the purchase of a new mudguard or two crumpled by a parking neighbor who failed to leave his card would pay a year's car fare or the rental of garage space.

The autoist himself would save money and I believe time by riding the street cars. Evidence gathered all over the country and pertaining to various makes of cars indicate that the average person cannot hope to operate a car for less than 10 cents a mile, or about \$500 a year. If the people knew the facts our traffic congestion would disappear. A recent ad in a Rochester paper read like this: "Save your car fare by buying one of our cars. Yearly car fare saved \$50. Lunches saved \$150. Total \$200. You can buy many of our cars for this amount." The fallacy is apparent. A person would save little if anything on lunches; they cost about the same at home as they do downtown. A \$200 car will have left in it only a one-year life. It will cost the user more than \$300 a year for gas, oil and repairs, so that he would have to pay the \$50 saved from car fare and \$450 more a year for the privilege of riding in a rattletrap which shattered his nerves and congested traffic.

I believe, all things considered, a man can save time by riding to and from his work in the street car. When he drives his machine there is the time and trouble getting started in the morning. There are the traffic jams and delays on the way and the possible accident, and then, at the end, the parking problem. The man wasn't far from wrong who said that he often passed his own house on the way to the office after finding a parking place. A man who rides the street car is not wasting his time. He can read his paper, cultivate acquaintances or plan his work. If the public could only be educated to this fact traffic congestion would be reduced, parking problems would be over and street cars still further speeded up.

WE SETTLE TOO MANY UNJUST CLAIMS

With each new automobile manufactured the traffic congestion is made worse and the possibility for street car accidents is increased. It is only through organized accident prevention work that they can be kept down. But hospital rates, doctors' fees and wages have increased so that our claim departments pay higher amounts for the same class of injury or damage than they formerly did. So even with less accidents it is barely possible to hold our own financially in accident prevention work. But there are several companies in the United States that are doing a wonderful work along accident prevention lines and greatly reducing the number of accidents.

A year's experience in accident prevention work has convinced me most accidents involve contributory negligence on the part of the other party, but railway companies settle because it is cheaper than a court action and they are afraid of a jury verdict. In this way the public has come to expect settlements. At the National Safety convention last year one electric railway reported it had collected more in claims than it had paid out. It had established a policy of paying nothing unless it was clearly at fault, and of suing to collect damages in every case where it was not at fault. The public there had come to learn that it would cost more to collect an unjust claim from the railway than it was worth, and that it was cheaper to settle a damage suit than to fight. Apparently no ill will was developed. The people respect the railway for ascertaining its rights. I wish every railway in New York State would do the same thing.

The best remedy to cure the ills that have been enumerated is publicity. When people know and understand the facts they are going to demand that the

electric railway industry gets justice.

If the railways want the traffic laws enforced they should help enforce them by co-operating with the police. In Rochester each motorman and conductor is equipped with a traffic report blank. When they see a traffic violation by an autoist, such as passing on the left hand side of a street car or passing a standing street car while it is loading or discharging passengers, they fill in the blanks on the card showing location, time, license, number, etc.

This card comes to the Safety Director and is given by him to the police. There it receives the same attention as if it had been sent in by a police officer. The autoist is called in and then he is called down. If he admits his guilt his operator's license is given a police punch. Three such punches and the motor vehicle bureau will refuse to renew his license. If he denies the report, but the police think he is guilty, they have the option of having a warrant sworn out for his arrest and then the traffic violator has to tell his tale in court. This is one way in which the railways can help enforce traffic laws.

Motor Vehicle Operation in Rochester*

City and Interurban Buses Give a Variety of Services—Express and Freight Services Also Discussed

By ROY R. HADSELL

General Superintendent of Transportation New York State Railways, Rochester

OUR principal reason for operating buses in Rochester is to serve the public and protect our investments against competitors. As we have operated the old-established system of transportation we feel that we are better qualified to handle this new mode of service, together with all forms of public transportation. We have 50 motor vehicles and we give a headway averaging from five minutes on city crosstown lines to three trips per day on some of the interurban lines.

On our co-ordinated lines we use drivers taken from the trainmen in the trolley service and on our interurban lines experienced independent drivers. Many of the latter were employed on the lines before we acquired them and they are well qualified for their work.

Our method of fare collection on crosstown city lines is the same as on trolley cars; that is, fare box with p.a.y.e. operation, issuing transfers to city car lines.

On the lines operating into the suburban districts city fares are charged to the city line and zone fares to the line terminals. On our interurban lines our fare is prepayment, the operator issuing a duplex. The passenger holds this duplex as a receipt and the operator turns in the stub to the auditing department as a record of his passengers carried.

OTHER SOURCES OF MOTOR VEHICLE REVENUE

The development of express revenue presents many problems, principally

*Abstract of paper at annual meeting of New York Electric Railway Association, Bluff Point, N. Y., June 25, 1926. because anybody can establish a trucking line to do express business, whether

in direct competition with an interurban railway or not. The result in many cases has been that the interurban railway express business has been ruined. In a certain case the railway company proposed to carry express and freight matter at a lower rate than the independent operator, but this policy was changed. A fair rate was established and the best service possible installed. The independent operator soon discontinued and the railway company found itself in possession of an auxiliary express business far larger than the sum lost by its interurban express line. This was because the trucks could give a direct collection and delivery service which formerly had to be performed by the individual industries. It is not at all difficult to secure a revenue of 75 cents a mile from this type of operation, most of which is business which the railway company never had before.

Most transfer freight between steam railroad stations is done by trail trucks. The truck backs up to a railroad station, the freight is loaded by the steam railroad, the truck is sealed and the transfer company hauls it to the other station, at which place the freight is handled by the steam railroad. There is no labor charge for handling the freight and it is not necessary for the transfer agent to assume the responsibility to bill it. It can, therefore, be done at a very low rate. As a rule, this transfer takes only two to three hours during the day, after which the truck can be used for whatever other express business the company may have. As there is a large volume of this business in the state and as it can be performed at a low rate and still give a good profit, it would seem to be

a source of auxiliary revenue which street railways should endeavor to get.

Another very profitable source of additional revenue is through chartered bus operation. The company with which I am connected has been unable to take care of all of this business which exists. In my opinion it is one of the most promising sources of auxiliary revenue for buses, as frequently it can be performed for short distances between the rush-hour periods. This tends to give a much better use curve of bus equipment.

Mail and package revenue, while not large in volume, is almost clear profit.

DETAILS OF PASSENGER SERVICE

In conclusion I will give a few details of our passenger operation.

The Rochester bus system consists of fifteen lines, totaling 238 miles in length. The longest is 70 miles and the shortest 2.7 miles. An average of 3,800 miles is operated daily, giving five types of passenger service:

1. A crosstown city service, providing means of transfer between twelve trolley lines.

2. A suburban service from the present trolley line terminals into the sparsely settled suburban districts.

3. A de luxe service from certain sections in the city to the down-town district. The fare charged is 15 cents or more without a transfer privilege.

4. Interurban service from outlying cities and villages into the city, providing a service similar to that on the electric interurban lines.

5. Service during the summer season to various lake or summer resorts from the city or car line terminals.

In one instance two lines give service to a section along the lake shore where the Rochester & Manitou Beach Railway was previously operated but was abandoned in 1924.

During 1925 we carried 3,500,000 on the bus lines mentioned.

In addition to the regular service, we have given a chartered or special service which to date has proved very successful. During the past year we made 190 of these trips, operating to Atlantic City, Philadelphia, Baltimore and Washington, as well as to nearer cities.

report of the committee on carhouses and car wiring of the A.E.R.A.

Mr. Schoen will have the committee compare relative standards to be discussed further.

Arc Welding Processes

WELDING wire was the subject of a meeting of special committee No. 6, arc welding processes for repairs to rails, of the way and structures committee of the Engineering Association. The meeting was held at Hotel Champlain, Bluff Point, N. Y., on June 26. Members present were C. F. Gailor, chairman; H. E. Bean, R. B. Fehr and A. L. Donnelly. Replies received to a questionnaire sent out on this subject with the purpose of determining the possibility of preparing specifications for welding rods were discussed. It was concluded that it would not be well to draft specifications of this kind during the present year, as the experience data available are not sufficient. It was decided to submit a brief report telling the aims of the committee and recommending that the work be continued by next year's committee.

Special Bulletins Available

FOLLOWING is a list of special reports that have been prepared by the bureau of information and service of the American Electric Railway Association and are available to member companies upon request:

Bulletin No. 87. Operating Costs of Motor Bus Operations of Electric Railways—1925. A study of the average operating costs of 92 electric railway bus undertakings in 1925 and a comparative study of the operating costs of 44 bus operations in 1925 and 1924. For each group, the operations have been classified as city, interurban, or combination city and interurban service. The depreciation methods adopted by each company are presented in tabular form and all of the data are illustrated by graphic charts.

Bulletin No. 88. Zone-Fare Systems on Electric Railways in the United States. Gives list of companies that have adopted the zone system; detailed description of how the zones were laid out, including maps; methods of fare collection; how the public was educated to the new plan; attitude of various public utility commissions toward the zone system; and results of operations compared with the previous flat-fare system.

Bulletin No. 89. Accident Statistics of Electric Railways—1925. A comparative summary and analysis of statistical data on accidents reported by 184 electric railways for the years 1925 and 1924. Some of the items shown are as follows: Total number of accidents; number of accidents involving motor vehicles; number of car collisions; number of persons injured; number of fatalities; total cost of claims; ratio of total cost to gross earnings; number of car-miles and number of passengers carried per accident, etc.

Bulletin No. 90. Trend of Material Prices. A new edition of the association's compilation, bringing down to date the trend of prices of material used by electric railways and furnished by the manufacturers of those materials.

Bulletin No. 91. Traffic Ratios—1925—Part 2—Interurban Lines. A tabulation of data for interurban lines similar to that given in Bulletin No. 82 for city lines. For interurban lines the data include the average speed, revenue passenger per car-mile, per mile of track, per car operated, operating revenues, revenue per mile of track, and operating income per mile of track.

In addition to the above, the following supplements have been prepared, bringing the information they cover down to July 1, 1926:

Supplement No. 4 to Trainmen's Wage Bulletin No. 69.

Supplement No. 4 to Busmen's Wage Bulletin No. 70.

Supplement No. 10 to City and Interurban Fare Bulletins Nos. 40 and 41.

Cost of Living Studies (Bulletin No. 92).

American Association News

Brady Safety Award Resumed

RESUMPTION of the Anthony N. Brady Safety Award has been announced by Arthur Williams, president of the American Museum of Safety, at the request of the American Electric Railway Association. This award was established in 1914, but was discontinued during the war. The award, consisting of a gold medal, was won in 1914 by the Boston Elevated Railway, in 1915 by the Union Traction Company of Indiana and in 1916 by the Connecticut Company. Included with the award is a silver replica conferred upon the officer or department head who has contributed most to the successful record of the company and a bronze replica to the employee whose services have been of signal value in the promotion of safety and health.

The resumption of the award has been made possible by the generosity of Nicholas F. Brady. It is distinctly an award of merit which is offered each year to the electric railway company making the best record in the safeguarding of the life and health of its patrons and employees.

The value of this competition in initiating a friendly rivalry among electric railway companies for the establishment of the best record in the conservation of human life cannot be overestimated. It focuses the attention of each company on the need for an intensive and continuous campaign among its employees and the public in safety matters. It tends to establish a very much higher *esprit de corps* among the employees of the various companies and it is of inestimable value to all competitors as an instrument for securing public good will, whether they win the award or not.

The announcement of the reestablishment of the award came too late to

open the contest during the present association year. Plans are being made, however, to review the conditions of the contest immediately to ascertain if any modifications are necessary to meet changed operating conditions of today. At the beginning of the 1926-27 association year the conditions of the competition will be publicly announced and all companies will be invited to enter the contest.

Fire Protection Discussed

MR. SCHOEN, Atlanta, Ga., chairman of the committee on carhouses of the National Fire Protection Association, presided at a meeting of those interested in carhouse and garage fire protection held at the office of the American Electric Railway Association on June 30. Several people connected with the insurance profession attended, also a number of railway operators who run buses, among them Charles Rufus Harte of the Connecticut Company, Adrian Hughes, Jr., of the United Railways & Electric Company, Baltimore, Md., and Alexander Shapiro, Washington Rapid Transit Company.

The meeting was devoted largely to outlining points to be taken under advisement by garage operators when considering the question of fire protection. Among the topics discussed were the maximum number of buses which should be stored in any one space, bearing in mind the number of entrances and the accessibility to the street; the question of building construction; whether there should be pits; whether tanking should be done inside or outside; the effectiveness of sprinkler protection; extent to which smoking should be permitted; fire-fighting apparatus, and a number of other matters made the subject of reference in the 1925

The News of the Industry

Talk of Settlement in Toledo Soon

Steps will be taken at once to draft a new franchise ordinance for Toledo, Ohio, embodying the principles recommended by Prof. H. E. Riggs of the University of Michigan following his survey of a year ago.

This action is prompted by receipt of a telegram from Henry L. Doherty from Mexico City by Mayor Fred J. Mery in which the traction head declares he is favorable to working out a new proposal. Mr. Doherty said:

I am desirous of co-operating with you in working out the city's transportation problem, using as a basis the principles set forth in the reports of Professor Riggs. I suggest that you have an ordinance drafted which will provide for carrying out those principles and then send the ordinance to me at New York. I will examine the ordinance and will promptly advise you of any suggestions I may have.

Professor Riggs has conferred with the Mayor and law department officials several times recently. Dewey C. Bailey, counsel for the Doherty interests, is also in the city, looking after legal matters. It is probable those interested in the ordinance will have a tentative draft ready soon.

The Riggs report suggests maintaining the general service-at-cost plan of the Milner ordinance, providing funds for improvements, inaugurating a city-controlled monopoly of bus and street railway operation by the Community Traction Company, maintenance of present 10-cent cash and three-for-25-cent ticket rates of fare, relief for the company from paving obligations and a change in financial sections of the ordinance so as to divert the present sinking fund-city purchase funds into a rehabilitation fund.

Under the financial plan the company would have 4 per cent depreciation reserve annually available for renewals and betterments.

It is estimated that nearly \$2,860,000 would be required in new money to secure the necessary economies and bus equipment to operate under the Riggs recommendations.

Concessions in power rates are also a part of the agreement reached in the supplementary report between Riggs and Doherty engineers.

Rensselaer Sticks to the Trolley

The Common Council of Rensselaer, N. Y., has defeated the ordinance permitting the Capitol District Transportation Company, a subsidiary of the United Traction Company, which operates in both Albany and Rensselaer, to supersede trolley service with bus service. Sentiment expressed by a rising vote in a public hearing was opposed to the bus project. Despite this the Albany News regards the action as regrettable. That paper said:

The trend now is against laying any more trolley tracks in city streets and few trolley

companies anywhere are extending their lines. There may have been a feeling in Rensselaer against the company for service that residents felt was not satisfactory. Yet service would have been improved through bus lines and this attitude hardly improves the situation in Rensselaer.

It is probable that Rensselaer will see this attitude was shortsighted and that eventually bus service will be permitted. Rensselaer is bound to grow and develop with the port. It will need better transportation.

Wage Agreement Ratified in Boston

An agreement has been reached by the board of trustees of the Boston Elevated Railway, Boston, Mass., with the carmen's union over wages and working conditions for another year, beginning July 1. This is the first time

for some years that the matter has not gone to arbitration.

There is no change in the basic rate of pay to the uniformed carmen, except the motormen of the subway trains, who will receive 76 cents an hour, an increase of 1½ cents. The carhouse repair men, of whom there are about 1,000 in the employ of the company, receive an increase of 4½ cents an hour, making their pay 80 cents, but their week is reduced from seven to six days. The uniformed carmen receive no more pay, but each one will receive a uniform free.

Edward Dana, general manager, says that both sides made concessions.

The agreement has been ratified by a special meeting of the union.

New St. Louis Franchise Made Public

Mayor Sees the Transportation Problem One of Great Concern and Importance—Wants General Discussion of Measure—Several Vital Points Left Open—Summary of Grant's Provisions

MAYOR VICTOR J. MILLER of St. Louis, Mo., on June 25 made public the official text of the proposed service-at-cost franchise ordinance under which the St. Louis Public Service Company will operate when it takes over the properties of the United Railways.

The Mayor proposes that there shall be a general public discussion of the measure prior to its passage by the Board of Aldermen or through a vote of the people. With this end in view several vital points were left open in order that the public might express its desires for the guidance of the city officials.

In general the tentative draft guarantees the company a fair return on its investment, through a sliding scale of fares, based on the cost of service, in return for the surrender to the city of control of its service and provisions in its contract which will make possible co-ordination of the street car lines with any existing transportation lines (including buses) or any future rapid transit system, with the possibility of universal transfers and the right of purchase by the city.

Mayor Miller also gave out a personal statement in which he tentatively approves the measure, but points out that before the ordinance as finally drafted can become effective it must be approved by the Board of Aldermen or the voters at an election, then approved by the Missouri Public Service Commission and accepted by the company.

The important points left open in the bill for the present are: The rate of return to which the company shall be entitled, the question of official recognition of labor unions, rules governing use of one-man cars and the preference

to be given in payment of special taxes.

These special taxes are fixed at 3½ per cent of the company's gross revenue and take the place of the present mill tax. The bill also provides that the back mill taxes now due, \$2,396,321, unpaid since Jan. 13, 1919, shall be met in six annual payments with interest.

A summary of the provisions of the service-at-cost franchise follows:

Fares—To be automatically fixed on a basis of a fair return upon valuation, after deducting cost of operation.

Valuation—To be agreed upon by city and company and approved by the Public Service Commission. With a rate of return commonly allowed by the Public Service Commission and under present operating conditions it is probable the rate of fare will be 7½ cents. The present rate is 7 cents, but Receiver Rolla Wells recently applied for an 8-cent fare with two tokens for 15 cents.

Service—The city to designate how many cars shall be run, how often and upon what routes. It may have any quality of service it is willing to pay for.

Extensions—City may order extensions to serve new districts, with the restriction only that they be self-supporting to a degree that the company may have an adequate return from the entire system.

Method of Control—Through a transit commissioner appointed by the Mayor but paid by the company, who shall have full authority to exercise all of the rights of the city.

Buses—The company is not required to operate buses, but may do so.

Life of Franchise—Thirty years if passed by the Board of Aldermen or 50 years if approved by a vote of the people.

Taxes—Company agreed to pay back mill tax judgment of \$2,396,000 out of earnings in six annual installments, with interest. Mill tax and other present franchise taxes are abolished and replaced by a flat tax of 3½ per cent of gross revenues. This is in addition to regular property tax of state and city.

Disputes—All disputes to be settled by arbitration. If city and company agree, Missouri Public Service Commission shall be the arbiter. If either declines to accept that office, the city shall select one or two and the company one or two arbiters and the odd arbiter will be designated by the senior Judge of the St. Louis Court of Appeals.



It Was a Good Fire and Raged Savagely

Grand Rapids Has a Bonfire

50,000 Rejoice at the Sight as Flames Relegate to the Realm of Limbo Antiquated Equipment Which Has Been Replaced by 27 Coaches that Are the Last Word in Sumptuousness

ALL OF its old, rickety, rattletrap street cars were consigned to the flames by the Grand Rapids Railway, Grand Rapids, Mich., in a huge bonfire at the West Michigan fair grounds Thursday night, June 24, while cheering throngs welcomed the advent of the modernized electric rail coach service and the passing of the antiquated equipment that had outlived its usefulness. The event was one of the biggest jollifications and night celebrations ever held in the history of the city. It was attended by nearly 50,000 people.

The bonfire, first of its kind ever held in the United States and the largest ever held in Michigan, and probably the entire country, because of its novelty and also because of its importance to Grand Rapids, proved a wonderful magnet in drawing a record attendance.

Advance advertising by the railway announced the affair as a jollification—and it was. The vast crowd seemed happy that the cars, some of which were nearly 30 years old, were to pass out of existence and be replaced by equipment as fine as that possessed by any other railway.

Mayor Elvin Swarthout had the honor of touching off the great bonfire. Surrounded by other city officials and prominent citizens, the Mayor applied the torch at one end of the long string of cars, while Louis J. DeLamarter, general manager of the railway, in the presence of visiting street railway officials, distinguished visitors and invited guests, simultaneously touched off the other end.

When the crowd saw the flames begin to lick their way through the cars a great cheer went up and continued

for several minutes. As the lurid glare from the oil and grease soaked cars grew brighter, illuminating the grounds so that a newspaper might easily be read anywhere, the people showed their happiness in many noise-making ways, auto horns predominating.

Primed with plenty of straw, grease, oil and parts of broken up cars, the fire was quite different from the one two years ago which made the use of these rickety and antiquated cars necessary. No fire engines responded to this blaze.

Within five minutes after the torch had been applied to the ends of the long line of cars, which stood in a semi-circle within the paddock in front of the grand stand, great jagged tongues of flame were shooting 100 ft. into the air. The flames were visible for miles around, while the lurid glare on the



Some of the Cars that Replace Those Destroyed

clouds could be seen from many surrounding towns.

Spectators loudly cheered for the new coaches as the flames rapidly devoured the old equipment.

Pathé Weekly and Universal and local movie men cranked their cameras as Mayor Swarthout and Mr. DeLamarter started the great fire and continued their cranking at intervals until it was nearly over. It did seem peculiar, but car No. 198, so old that railway officials were fearful of hazarding a correct guess as to its age, was the last car to cease burning. This veteran car was rebuilt in 1902.

Long before 8 o'clock the big grand stand was filled to capacity. By 8:30 every available parking space on the

"There'll Be a Hot Time in the Old Town Tonight."

Promptly at 8:30 Mr. DeLamarter gave the signal and three giant aerial bombs soared skyward, exploded with war-like detonations and the big jollification was on.

When Miss Ruth St. Clair gave the word "Let 'er go!" her big balloon started skyward and things began to happen. She carried with her a large supply of fireworks and fuses which burned brightly as she sailed into the air. She landed in the Grand River, swam ashore and returned to the grounds, to be roundly applauded.

The ascension was followed by one of the most gorgeous pyrotechnic displays seen in western Michigan. Great

The railway had put extra cars on the line serving the fair grounds and at 10:30 the last passenger had left for home and was being rapidly carried back to town, while the autoists fumed and fretted.

Jupiter Pluvius sprang a surprise with a severe downpour 30 minutes after the jollification was concluded. The storm passed as quickly as it came.

Mr. DeLamarter was congratulated by city officials, business men and prominent citizens in the successful culmination of his aim to give to Grand Rapids and its residents the most modern type of electric rail coach and a railway service that would bring credit not only to himself and his company but to the entire railway industry.



Old Cars Lined Up on the Afternoon Before the Fire



Mayor Swarthout Touching Off the Fire with a Torch

grounds was taken. The crowd lined the paddock fence and each side of the stand. Autoists, caught in the jam on the highways leading to the fair grounds, parked their cars as far as 2 miles from the grounds and walked to the bonfire.

While the crowd was assembling and until the program started, there was an enjoyable concert by the Grand Rapids Commercial Drivers Safety Club Band, of 100 pieces, which donated its services for the event to show its appreciation to the railway of the new coaches and improved service. The band played a funeral dirge when the cars were set on fire, a few moments later swinging into the appropriate notes of

aerial torpedoes carried the story of the event to the thousands in the grounds, while the reverberating echoes wafted the message to nearby towns. The fireworks were climaxed by big and special set pieces directly in front of the grand stand. When the company's well known slogan, "Don't Worry! Relax! Ride the Street Car. The Safest Place in Town," was emblazoned in letters of living fire, the colored words were greeted by an expression of public good will in long and continuing cheering and applause.

Then came the bonfire, the big event of the evening. Mayor Swarthout, torch in hand, was ready officially to start the conflagration. Turning to city officials and prominent citizens, he said that the honor gave him great pleasure because it marked the passing of the old-time railway service, ushered in the new and more modernized and blazed the way for a forward movement for the local railway and the industry as a whole. Dedicating the new cars to the people of Grand Rapids, he touched the fuse and history was in the making.

Jammed in every conceivable position, the thousands of autoists were unable at the conclusion of the ceremonies to extricate their cars from the maze for more than two hours. They sat and waited for an opening in the traffic within the grounds while idling motors burned up thousands of gallons of gasoline.

The day preceding the jollification representatives of several other railways were guests of Mr. DeLamarter in an inspection of the new coaches in service. Among the visiting officials were R. S. Bull, superintendent of the shops of the Pittsburgh Railways, and T. E. Allerdice, superintendent of the Homewood shops of the same company; J. P. W. Brown, vice-president of the Nashville Railway & Light Company, Nashville, Tenn.; E. D. Reed, manager of the Chattanooga Railway, and J. J. Geringer of Evansville, Ind., general superintendent of the Southern Indiana Gas & Electric Company.

"Service that Is Service"

Within the covers of an eight-page booklet issued by the Northern Ohio Traction & Light Company is told the story of 670 lb. of forgings which went from Alliance, Ohio, to Detroit, Mich., in less than five hours. It is the story of the fastest freight service on record. The company asks consideration of this service when shipments in small or carload lots are made. In another booklet even smaller the company tells the story of a casting—which journeyed from Peoria, Ill., to Alliance. One shipment will convince you, the company advises, of what this service supplied by the traffic department will do for you.

New Jersey Board Approves Higher Fare

Just and reasonable are the increased rates of fare proposed to be put into effect by the Morris County Traction Company, Morristown, N. J., operating more than 50 miles of interurban line and running in Newark over the tracks of the Public Service Railway. The Board of Public Utility Commissioners of the state has so declared. In consequence, effective July 1, the rates will be 10 cents per zone for regular riders, and 5 cents per zone for school children. The old rates were 7 cents and 3 cents.

In the petition filed by the receivers of the company it was set forth that \$180,250 was required to carry out improvement work deemed necessary. It appeared, further, that no interest had been paid on the bonds of the company by the receivers and that \$101,893 was due for unpaid taxes prior to 1925. In addition \$9,212 is due on taxes for 1925.

Revenue for 1925 was \$541,109, and after deducting operating costs, taxes and rentals there remained a net revenue of \$55,142 for 1925. The increase in fare is desired to provide additional principal for the improvements required. The petitioners estimate that the revenue obtained under the new rate, will be 15 per cent less than if the same number of passengers carried in 1925 at 7 cents and on a weekly pass is carried at 10 cents, and provided also that the same number of 3-cent riders carried in 1925 is carried at 5 cents. This would return gross operating revenue of \$630,275, compared with \$541,109 for 1925 under the present rate, an amount sufficient to carry out the improvements required.

Analysis of data submitted indicated that there was a general and material increase in the various items entering into the cost of operation and maintenance of the property from 1911 up to date including taxes; the cost per car-mile was less during 1924 and 1925 than the average of a large number of companies operating under similar conditions. The financial statement indicated that the net income during the past eleven years had varied from \$18,452 in 1923 to \$86,262 in 1916, the net income for 1925 being \$55,002. These figures, however, do not include allowance for depreciation and taxes.

The board held that the company was now confronted with increased expenditures for improving its roadbed, and while it might be doubtful whether the increased fares would produce sufficient revenue for this purpose, the board believed the plan should be put in effect. The question of a reasonable return on the value of the company's property did not arise. The problem was one of earning operating expenses and raising funds for necessary improvements.

Only a few of the municipalities through which the company operates objected to the increased fare.

Wages Advanced in Duluth

An upward revision in wages of employees has been made by the Duluth Street Railways, Duluth, Minn., effective July 1. For motormen and conductors, the first year of service, the new scale is 46 cents an hour, 48 cents the second year, 50 cents the third year,

52 cents the fourth year and after. This compares with 50 cents now paid under the last wage change in 1922. One-man car operators will receive the above scale, plus 5 cents an hour. Mechanical department employees, permanent engineering and roadway department employees and all other employees paid on the hourly basis will receive a wage increase of approximately 5 per cent.

Hearings on Milwaukee Service

An ex-Alderman, Henry Bulder by name, a former opponent of the one-man car, appeared before the Railroad Commission of Wisconsin recently to make a public retraction of his statements concerning the use of one-man cars in Milwaukee. He said the trial period now in progress on the Walnut Street line had convinced him and the people he represented that the one-man cars were giving the section in which he lived better service than they had before—that there were more seats and that the wait for cars had been cut down.

About four months ago the commission conducted a public hearing on the application of the Milwaukee Electric Railway & Light Company for the introduction of one-man cars on the Walnut Street line as a measure of economy. The ex-Alderman was among a number of politicians who denounced the commission. He said at that time: "If the commission grants the request of the company each member of it should be hanged. A movement by the citizens will be started that will threaten violence."

During the week ended June 26, when the commission was conducting a public hearing on some general recommendations of its engineers, requiring the company to add 70 more cars, the ex-Alderman asked to be heard and made the statements quoted previously.

At the hearing on the general survey conducted by the Railroad Commission's engineers, the company introduced evidence to show that if the commission's rail extension and additional rolling stock recommendations were put in the form of an order it would cost the company \$1,971,000 and would reduce the net income to 3.6 per cent. The company acknowledged that the commission's engineer's survey disclosed a number of discrepancies and that the company would remedy them.

The commission's engineer stated that he believed the company had taken the wrong attitude in refusing to make rail extensions into rapidly growing sections of the city now unserved. He said that if the company made the extensions more riding would result.

S. B. Way, president of the company, took direct issue with the engineer on the usefulness of the articulated trains. The commission's engineer stated the articulated trains distorted schedules on many of the lines on which they are used. Mr. Way contended that the articulated trains had proved themselves indispensable, particularly at rush-hour periods.

Mr. Way informed the commission that the company had made a proposal to the city for a complete traffic survey. The company, he said, would finance the expense up to \$50,000.

25 per Cent Wage Increase Asked in New Jersey

Trainmen and affiliated workers of the Public Service Railway, Newark, N. J., have approved the proposed wage increase demand to be made Aug. 1. The demands will include a 25 per cent wage increase and various changes in present working conditions. At the time the rates now in effect were agreed upon the bus operators and their affiliated maintenance and construction groups did not have to be taken into consideration, as the buses were practically all controlled by independents.

In a lengthy statement which he made early in June, Mathew R. Boylan, vice-president in charge of railway operation for the Public Service Corporation of New Jersey, made plain the position of the company at the present time. His remarks were reviewed in the *ELECTRIC RAILWAY JOURNAL* for June 5, page 986. He said at the time that company officials felt the transportation situation can be corrected by complete co-ordination of street car and bus facilities and relief from paving obligations, combined with "a return to the rate of wages in effect prior to Aug. 1, 1923, and still greater co-operation from employees."

The agreement expires by limitation on Oct. 1.

Old Toledo Rate Renewed

Employees of the Community Traction Company, Toledo, Ohio, have approved a renewal of the wage and working agreement at the old rates of wages for a year from June 1, 1926. The men asked a flat increase of 10 cents an hour. The company submitted an offer of an increase of 2 cents an hour with elimination of payment for lapse time, meal relief and layover periods. This offer was rejected by the men by a vote of more than five to one. In a final offer the company withdrew the offer of an increase in wages and stated the last offer would be on the basis of the old agreement. This plan was accepted by a close vote. Under the new contract the company will provide \$15, or about half the cost of each uniform in case the men are asked to change the style of uniforms this year.

Mayor Refuses to Rush Bus Franchises

Until he has determined what course is for the best interest of the city of New York, N. Y., Mayor Walker will not grant any bus franchises. This and more emphatic statements from him were his reaction to a large delegation from the Bronx Citizens' Bus Committee who went to City Hall on June 30 to urge speedy action on bus installation for that borough. The Mayor scored the threats made upon him in this matter of granting bus franchises and the false rumors to "rig" the stock market. Within the coming month he believed the Board of Estimate, which body has been considering 200 applications, would be prepared to bestow the franchises after having given thorough scientific study to the matter. He said he knew the Bronx needed buses, but he was working for the entire city of New York.

Union Request at Chicago Opposed

Demands of motormen and conductors of the Chicago Surface Lines for a blanket raise of 5 cents an hour in wages, a \$1,000 insurance policy and a \$20 a week sick benefit for each employee, which followed the expiration of their contract on June 1, are not likely to be granted. According to authentic reports, officials of the railway have refused to consider the signing of any agreement that extends beyond Feb. 1, 1927, the date on which the present franchises terminate. Heretofore, wage scales have been adopted for periods of one, two or three years. Union leaders say that negotiations will not be begun until August.

Traffic Experts for Newark Hired

Engineers of the firm of Parsons, Klapp, Brinckerhoff & Douglas, New York, will begin work immediately on a survey of traffic and transportation of Newark, N. J. This announcement was made recently by Chief Engineer Costello of the Department of Public Affairs, representing Mayor Raymond. Mr. Costello said the work of the engineers would consist of a survey of the needs of the transportation system, both trolley and bus, including interstate and intrastate bus lines, a study of the co-ordination of trolleys and buses, recommendations for the correction of weaknesses and a study of the general traffic situation. Henry M. Brinckerhoff will be the directing engineer of the survey.

Atlanta's Suburban Cars Welcomed

Patrons of the Stone Mountain and Marietta electric lines of the Georgia Railway & Power Company, Atlanta, Ga., welcomed with fitting ceremonies recently the arrival of the first four of the new series of luxurious cars which went into service on the two lines on July 1. The new cars were presented formally to their patrons and accepted by city officials and civic leaders of the communities in ceremonies held in Marietta, at the court house square and in Stone Mountain near the railroad station.

The two cars, identical in construction and appearance with the others to be delivered shortly, were opened for inspection and an informal "house warming" by the patrons immediately following the presentation exercises in both places. Instead of numbers, the cars will bear the names of distinguished citizens whose public service in a former generation laid the foundation for the present prosperity and greatness of the sections they serve.

Cumberland Lines

The Cumberland Traction Company, Bridgeton, N. J., has taken over the lines of the Millville & Vineland Traction Company and the lines of the Maurice River Transportation Company. A new company will be formed, to be known as the Cumberland Lines, according to Clayton McPherson, general manager of the company.

The Millville & Vineland Traction Company has been operating the railway line between those two cities for a number of years. About a year ago negotiations were made with Mr. McPherson for the purchase of the line. However, the final steps in the deal were not taken until a few days ago. It is the plan of the Cumberland Lines to put new and modern cars on this route and to reorganize the system.

The Maurice River Transportation, another recently acquired property, has been operating a bus line from Vineland, Millville and Port Norris. New bus equipment will be placed in service on this route also. This company has sold its interest outright to the Bridgeton concern, while in the case of the trolley line the lease has been purchased for the remainder of the franchise time, which is 70 years.

The Cumberland Lines, the new operating company, will take charge on Aug. 1. The railway line of Bridgeton and the bus line running from Bridgeton to Philadelphia, which was recently started by Mr. McPherson, both come under the Cumberland Lines.

Newspapers Praise Late John E. Duffy

Opinion was general in Syracuse and vicinity that few men in electric railway work were superior to the late John E. Duffy, general superintendent of the New York State Railways, from the point of ability. Newspaper comment since his death has elaborated on his loyalty, his attention to duty and his ardent zeal. The character of the man, who long helped to direct the affairs of the New York State Railways in Syracuse, was summed up by one commentator as follows:

He knew the business thoroughly from long association with it; he had the confidence of those who had their money in the enterprise and equally of the men on the cars; he was always courteous and cordial with his public; he was on the square.

New Tunnel Plan Advocated at Kansas City

At a meeting held in Kansas City, Mo., on June 22, the board of directors of the Business District League adopted a resolution indorsing the proposal of a new or enlarged Eighth Street tunnel, and favoring the proposal to permit the Eighth Street Viaduct to remain as it now stands.

Heretofore the Central Industrial District group has advocated an enlarged tunnel and a wider viaduct for Eighth Street. The Main Street body some time ago voted to urge the removal of the viaduct from Eighth Street. The resolution also urges the early resumption of through service by the Kansas City Railways over the Eighth Street lines through Greater Kansas City. On the following day a similar resolution was approved by the Club President's Round Table.

The questions arising out of the alleged unfit condition of the viaduct and the tunnel on Eighth Street have been the foundation of much contention. The approval of the sale of the Kansas City Railways' property under foreclosure has served to bring these problems before the public eye again.

Newspaper Indorses Proposed Louisville Grant

The *Courier-Journal* of Louisville, Ky., has gone on record as approving the new franchise grant for the Louisville Railway mentioned frequently in the *ELECTRIC RAILWAY JOURNAL*. That paper believes that in order to supply an urgent public need which could not otherwise be supplied public interest demands the passage of a new ordinance similar to the one submitted to the Mayor and the City Council of Louisville. That paper says in part:

In briefest terms, Louisville needs more transportation facilities. The railway must borrow the money to supply these facilities. It cannot borrow this money under the present ordinance. It can borrow the money if the ordinance submitted should be adopted by the city authorities. Should the ordinance be adopted the people of Louisville will be protected against excessive rates both by their representatives in the City Council and the Mayor's office, and by the courts, in the same fashion and to the same degree that the company will be protected against rates so low as to be confiscatory. In the construction of the new lines now so urgently needed the city will have to rely, to an extent, upon the good faith of the owners and managers of the railway company, but the *Courier-Journal* believes that the city takes no undue risk in relying upon the good faith of the railway officials, and, moreover, that they should be credited with the ordinary common sense which would impel them to carry out these improvements with intelligence and with reasonable rapidity, since their own interest is primarily involved in doing so.

Every Day Episode Depicted in Unusual Movie

A convincing argument showing that it is cheaper, safer and far more convenient to use street cars for trips to and from the business section than it is to drive motor cars is made in a moving picture contributed to the Clarksburg, W. Va., Police Department pension fund by the Monongahela-West Penn Public Service Company. The screen flashes the trials of Mrs. Penn and her two children, who urged her to take them to the theater on a Friday afternoon. They are shown leaving their home in the mother's coupe and getting caught in a traffic jam in the theater district. Mama ignores a traffic signal and, ordered to "back up," becomes the cynosure of laughing crowds on the sidewalk. Best clothes are soiled through alighting over the fenders. When finally the party arrives at the box office the matinee has been in progress many minutes. The disheartened group then decides to return home. The next trial is finding the car tagged for parking too long and an order to report to the police court. Disgusted, mother and daughters return home, resolved never again to use the automobile, but to use the old reliable street car, ready and anxious on the screen and street, too, for its patrons.

Wage Scale Continued.—The Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., has concluded an agreement with its trainmen of the rapid transit lines, continuing for another year the existing wage scale. It was stated that present negotiations with other groups of employees indicated similar agreements for continuing the present wage for another year.

Recent Bus Developments

Cities' Approval Necessary for Operation in Wisconsin

A decision of far-reaching significance with reference to the intracity operation of bus lines in Wisconsin by electric railways as well as independent bus operations was handed down by the Railroad Commission at a special hearing in Eau Claire on June 23. Under this ruling any company wishing to operate a bus line in a Wisconsin city hereafter must first have the city's approval of the route its buses will follow within the city before the commission will issue a permit. This new decision by the commission erases all doubts which prevail under the existing laws concerning the authority of a city to regulate buses within its own corporate limits.

The case involved was the application of the Motor Bus Company of Chippewa Falls for a renewal of its license, which expired on July 1, covering the use of the streets in Eau Claire by its Eau Claire-Chippewa Falls intercity line. The city opposed the application and based its fight on the ground that the buses as now routed in Eau Claire had added seriously to an already congested traffic condition in the business district. Last April the city attempted to regulate the bus routes in the city by an ordinance which was passed, and in the battle which followed the validity of the ordinance was set aside by a lower court. In this case the court held that the bus company received its permit from the commission and the city, therefore, had no authority to alter its route.

As a result of the commission's decision, which carried with it a flat denial of the new application for a license, the company finally agreed to operate hereafter in accordance with the routes and stops designated in the ordinance passed by the City Council last year. The decision apparently does not apply to existing lines which already have a license from the commission, but will be applied to companies seeking a renewal of their yearly license as well as prospective bus line operators.

Cities hereafter will be notified by the commission whenever an application for a bus line permit is made so that the community concerned may have an opportunity to object to or approve the route selected by bus lines.

White Rock Bus Line Opened in Dallas

The White Rock bus line, to be operated by the Dallas Railway, Dallas, Tex., will be started at once. The buses are of the coach type, seating 21 persons. They will run on a 30-minute schedule, connecting with the terminus of the Mount Auburn railway line at Lindsley and Monte Vista Avenues. From this spot the buses will traverse Blair Boulevard, Ash Lane Avenue, West Shore Drive, Warwick Avenue, Lake Shore Avenue and thence along a

country road to the Garland road and then to a point opposite the White Rock Dam and return over the same route. The fare from the terminus of the car line to White Rock will be 4 cents, making the total fare from any spot in the city to the lake 10 cents for tokens or 11 cents for one cash fare.

Parade Celebrates Peekskill's Change from Trolley to Bus

With a celebration that anticipated the Fourth, Peekskill, N. Y., on July 1 ushered in its new bus system. At the same time, it said good-bye to its electric railway. Many of the 16,000 inhabitants turned out to witness a parade of the old trolley cars and the new buses through the village. The Peekskill Lighting & Railroad Company tuned up three of its oldest cars especially for the occasion to lead the parade. They were followed by the nine new White buses which will take over the transportation service in the village. Fireworks and a band livened the procession.

The trolley system in and around Peekskill has been going by degrees. In 1924 a 3.5-mile line to Mohegan was abandoned. The 5-mile line to Oregon followed in 1925. Other bus operators took over these routes. Now the 7 miles of line which the company still operated has given way to buses to be operated by a subsidiary, the Peekskill Motor Bus Company.

Peekskill extends north and south, but its trolley tracks extend east and west. By substituting buses it made it possible to serve populous sections not reached by the railway. Instead of 500 car-miles operated daily the buses are traversing 1,300 miles. Instead of two railway routes aggregating 7 miles there are four bus routes totaling 14 miles. More buses to bring the total to fifteen will be added if necessary.

Stricter Motor Carrier Insurance Rules in Oklahoma

The Oklahoma Corporation Commission has called a hearing at the State Capitol on July 8 to determine what further rules and regulations should be made governing the issuance of insurance policies for the protection of the public and patrons of bus carriers. In Journal Entry 1471 the commission sets out several proposed amendments to Order No. 2219, which contains rules and regulations governing motor carriers. These amendments propose stricter regulation of the issuance of insurance policies. The regulations propose, in substance, that policies should provide that they cannot be canceled except upon 30 days notice to the commission; that they should not contain any clause stating that "delinquency in payment is a ground for non-liability" or any similar statement. Policies should contain a provision for the protection of personal property and

hand baggage. It is proposed to eliminate from policies provision that they may be voided because of carelessness on the part of the driver. Policies should cover liability to patrons in any motor vehicle owned by the licensee.

The commission may refuse to accept any policy wherein it appears that the patrons of the motor carrier are not protected. The commission will consider whether or not the amount of liability insurance should be increased and in proportion to the number of persons carried. The commission proposes to grant only policies which show on their face that they are paid up for a period of at least one year, and will not receive so-called "binders" or other evidences of contract for insurance. Policies covering patrons of motor carriers should be continuous, and policies issued to licensees covering the period succeeding the current year should be filed with the commission at least fifteen days prior to the expiration of the policy now on file with the commission.

Peace the Objective in Tacoma

Officials of the Puget Transportation Company have acknowledged that the City Council of Tacoma, Wash., is within its rights in revoking the permits issued to it for the operation of buses on the Point Defiance line. This action has removed the possibility of friction from the attempts to settle the transportation problem. The bus operators declared, in short, that they had no desire to embarrass the city officials. The Mayor then wrote into the record the provision that if no settlement is reached with the Tacoma Railway & Power Company the Puget Transportation Company will have precedence in any restoration of bus service on the Point Defiance line. The loss of independent bus rights was referred to previously in ELECTRIC RAILWAY JOURNAL.

Extension of Service in Buffalo

The Delaware Avenue double-deck bus line of the International Bus Corporation, subsidiary of the International Railway, Buffalo, N. Y., has been extended from the Buffalo city line to the north village line of Kenmore, where it connects with a new single-deck bus line to the city of Tonawanda. Franchises for the operation of buses in the village of Kenmore, the town of Tonawanda and the city of Tonawanda were granted by the local boards and application for consents is pending before the commission.

Under the franchise with the village of Kenmore, the Delaware Avenue buses will charge a 5-cent fare within the village or commutation tickets will be sold in strips of ten round trips from Kenmore to any point in Buffalo for \$2.50, making the single round trip fare 25 cents. An extra 5-cent fare will be charged from Kenmore to the city of Tonawanda. Passengers boarding the Delaware Avenue buses in Kenmore are permitted to transfer to Buffalo cars at the Buffalo city line upon payment of a 10-cent fare, which makes the bus fare in Kenmore 2 cents. The local fares in Buffalo are 8 cents or four tokens for 30 cents.

Financial and Corporate

City and Suburban Traffic in Atlanta Grows

The gross revenue from railway lines of the Georgia Railway & Power Company, Atlanta, Ga., for the year ended Dec. 31, 1925, was \$5,436,441, or 35.8 per cent of the total earnings. Extensions, improvements and betterments to the property completed during the year, or in the course of completion as of Dec. 31, 1925, involved total expenditures for the railway department of \$1,442,120. During the year the company purchased 60 electric railway cars of the most modern type, including 40 one-man safety cars. The Atlanta Coach Company, all of the stock of which is owned by the Georgia Railway & Power Company, purchased and placed in operation during the latter half of the year fifteen double-deck gas-electric drive coaches, which are being used in supplementing the service furnished by the railway in Atlanta.

	1925	1924	1923	1922	1921
City and suburban system.....	94,636,746	92,029,437	95,357,117	92,172,664	91,358,379
Stone Mountain line.....	657,500	640,634	634,014	557,274	672,741
Atlanta Northern.....	962,496	1,202,985	1,218,697	1,131,278	1,178,852

The number of passengers carried on the city and suburban system, on the Stone Mountain line and on the Atlanta Northern Railway, which is the inter-urban line between Atlanta and Marietta, for each of the last five years is shown in the accompanying table.

The annual report to the stockholders does not segregate the railway earnings.

Fewer Passengers in Des Moines

Seventy-three thousand fewer revenue passengers were carried by the Des Moines City Railway, Des Moines, Iowa, during the month of May than in April, and total operating revenue for the last month was \$191,705, compared with \$198,690 for April. The gross revenue, less operating expenses and taxes of \$153,314 and fixed charges amounting to \$37,990, left \$99,52 for the stabilizing fund, compared to the balance of \$4,176 shown in the April statement. The stabilizing fund now stands at \$12,957. Revenue passengers carried during the month totaled 1,958,463.

\$200,759 Value Placed on Jamaica Central

The hearings before the New York Transit Commission pertaining to approval of the securities to be issued by the Jamaica Central Railways, Inc., were concluded on June 15. The commission reserved its decision. Aside from bringing out the story of the inception of this railway, referred to in ELECTRIC RAILWAY JOURNAL of June 19, 1926, page 1078, the principal feature of the hearings was the testimony of Ira W. Fisk of Fisk & Roberts, New

York, consulting engineers for the company, relative to depreciation, working capital required and the value of the physical property.

Mr. Fisk testified that the present-day value of the property other than real estate and buildings was \$200,759, based on the appraisal made by his firm. He advised that the company should set aside a tentative depreciation fund on the basis of 3.25 cents reserved per car-mile operated. Requirements for working capital were put at \$20,000.

Surplus in Terre Haute

For the year ended Dec. 31, 1925, the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., reports a surplus of \$167,733. After the consideration of sinking fund the company finished the year with a deficit of \$59,780. Gross earnings for 1925 decreased \$143,247 over 1924 due to the constantly increasing use of privately

owned automobiles as well as bus and motor truck competition. Operating expenses increased \$87,062 due to power plant equipment. The freight earnings for 1925 were \$561,680, compared with \$609,460 in 1924. These facts were brought out in the annual report to the stockholders, submitted on June 9.

There was expended and charged to capital account an amount of \$123,453, which represents the grand total on owned and leased lines. On the Terre Haute division a single-track loop was constructed around the court house at Terre Haute, power lines were extended and ten buses purchased to meet the bus competition.

EARNINGS AND OPERATING EXPENSES OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN

	1925	1924
Gross earnings.....	\$4,852,170	\$4,995,417
Operating expenses.....	3,847,397	3,760,335
Net from operation.....	\$1,004,773	\$1,235,082
Taxes.....	153,225	244,167
Maintenance expenditures:		
Maintenance of way and structure.....	\$613,022	\$706,601
Maintenance of equipment..	358,573	304,558
Maintenance of power plant buildings and equipment...	154,780	135,032
Total railway maintenance.	\$1,126,375	\$1,146,091
Maintenance of light and power.....	203,694	235,165
Total maintenance.....	\$1,330,070	\$1,381,257

MISCELLANEOUS STATISTICS OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY FOR YEAR ENDED DEC. 31, 1925

Passengers carried—interurban lines.....	4,917,719
Passengers carried—city lines.....	19,137,310
Total passengers carried.....	24,055,029
Car-miles operated—interurban lines.....	6,572,607
Car-miles operated—city lines.....	3,650,567

Partial Abandonment in Joplin Announced

Abandonment of its Main Street lines in Joplin and all city transportation service is suggested by the Southwest Missouri Railway in a letter sent to Mayor J. F. Osborne and the City Commission.

The railroad contemplates rerouting its main line cars over West Fourth Street to McKinley Avenue and then south to its present main line in Joplin Heights, and would remove its present double tracks on Main and West Twentieth Streets.

Accompanying the letter was a proposed ordinance that would give the concern permission to build tracks across Seventh, Thirteenth and Twentieth Streets at points approximately where McKinley Avenue, were it extended, would intercept those streets. Application will be made to the Missouri Public Service Commission to make the change.

The letter states that the change of line and rerouting are contemplated "largely on account of the inability of the transportation company to pay a proportionate part of the repaving of Main Street in Joplin, an improvement which will become imperative within the near future and which, on account of the financial condition of the railway, cannot be assumed."

Augusta-Aiken Deal Approved

Stockholders of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., have voted the issuance of \$2,000,000 in bonds, \$1,500,000 of which will be sold immediately. A deal involving the purchase of the common stock of the Georgia-Carolina Electric Company by the Georgia-Carolina Power Company, a subsidiary of the Augusta-Aiken Railway & Electric Corporation, has also been consummated. Purchase by the Georgia-Carolina Power Company of the Carolina Light & Power Company of Aiken, S. C., was also confirmed. Transmission lines and distribution systems in Georgia, including part of the transmission lines constructed by the Georgia Railway & Power Company, were also purchased. These lines extend from Stevens Creek to Broad River, on the line from Stevens Creek to Toccoa, and involve an expenditure of approximately \$380,000.

The bonds offered for sale are to be handled by Redmond & Company and J. G. White & Company, both of New York City. Of the \$2,000,000 bond issue authorized only \$1,500,000 will be sold now, leaving \$500,000 in abeyance. The money acquired by the sale will be used in purchasing the properties outlined.

Traffic in Winnipeg Improves in 1925

A. W. McLimont, president of the Winnipeg Electric Company, Winnipeg, Man., in the 33d annual report to the stockholders, states that the hope that the added commercial and industrial activity noticeable in 1924 would assist the railway utility to register improvement in 1925 had materialized, and that as a result the decreases in traffic which

had been experienced yearly since 1920 were checked. The street railway department carried 55,096,000 revenue passengers in 1925, which is a slight increase over 1924. Operating expenses of the railway were reduced largely as the result of extending one-man operation to a number of city lines. This was accomplished by slight alterations to a number of street cars and equipping them with special apparatus.

INCOME ACCOUNT OF THE WINNIPEG ELECTRIC COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Gross earnings from operation.....	\$5,211,665
Operating expenses before charging depreciation.....	3,301,903
Net operating income.....	\$1,909,761
Miscellaneous income.....	157,604
(Includes \$54,000 interest charged subsidiaries in excess of earned fixed charges for the year 1925.)	
Gross income.....	\$2,067,365
Deduct:	
Interest charges on mortgage stock, bonds and bank loans....	\$872,914
Extinguishment of discount on securities.....	26,764
City percentage and car license....	154,237
Taxes.....	163,965
Miscellaneous non-operating taxes.....	3,031
Other income deductions.....	24,847
	1,245,761
Net income before charging depreciation	\$821,604
Deduct:	
Depreciation.....	201,050
Net income transferred to surplus.....	\$620,554
Surplus brought forward from 1924 as adjusted.....	594,788
Net income transferred.....	\$620,554
Additional depreciation.....	173,000
	447,554
	\$1,042,343
Dividends on 7 per cent cumulative preferred stock.....	\$210,000
Dividends on common stock....	220,000
	430,000
	\$612,343
Deduct appropriations:	
Sinking fund reserve.....	\$73,100
Deferred and undistributed charges such as stock discount and expenses.....	158,955
	232,055
Surplus carried forward.....	\$380,287

The company made substantial additions and improvements to its property in 1925, including new car tracks between Winnipeg and St. Boniface, permitting cars to make use of the fine Provencher bridge, and seven new buses. The alterations to street cars making them adaptable for one-man operation were also important.

Marion Company Gets Another Property

Agreement has been reached for the sale of the property of the Richwood Light, Heat & Power Company to the Columbus, Delaware & Marion Electric Company, Marion, Ohio. This action has brought a sudden end to a suit of the Richwood company against the Columbus, Delaware & Marion which had been won in the lower courts by the defendant company and appealed by the Richwood company.

The suit came up for hearing in the Court of Appeals at Marion during the week ended June 26, but before it was opened attorneys representing the companies, including the Ohio Edison, agreed to terms for the sale of the Richwood plant to the Columbus, Dela-

ware & Marion. The terms of the agreement were not made public. The Columbus, Delaware & Marion Electric Company is a combined light and railway property.

Readjustment of Public Service Railway Finances Impends

Readjustment of the financial structure of the Public Service Railway of New Jersey and affiliated companies, which comprise the transportation system of the Public Service Corporation, is under discussion by a special committee.

According to the *Wall Street Journal* one of the main purposes of the proposed readjustment is financial unification of the entire transportation system, similar to that effected a few years ago when the electric and gas systems were consolidated into one company, the Public Service Electric & Gas Company. Any plan that is finally decided upon is likely to provide for the formation of a new company and exchange of the latter's securities for those of various operating subsidiaries and affiliated companies in the transportation division. About \$75,000,000 bonds, all told, and about \$73,000,000 stocks now outstanding would be involved.

Railway and bus earnings have improved each month this year over 1925 in that net losses have steadily been reduced; but the transportation system as a whole has shown deficits for a number of years.

Bonds Issued.—Authority to issue \$235,100, par value, of first and refunding bonds bearing 5 per cent interest has been granted the Evansville & Ohio Valley Railway, Evansville, Ind., by the Indiana State Public Commission. It was announced that the bonds are to be exchanged at par for \$235,100 in 7 per cent preferred stock of the company, which is now outstanding.

Presents Plea for Revaluation.—The Duluth Street Railway, Duluth, Minn., at a recent hearing before the Minnesota Railroad and Warehouse Commission in Duluth presented arguments on its petition for a revaluation of the company's properties for the purpose of obtaining an increase in fare. A. L. Drum, the company's engineer, and Herbert Warren, vice-president, presented statistics showing that the company was not making a proper return on the invested capital. The company is seeking an 8-cent fare.

Financial Status in Spokane Not Improved.—Deficits of \$20,484 in April and \$16,050 in May are reported in statements of the Spokane United Railways, Spokane, Wash. Because of increased competition from private automobiles the United Railways has not experienced the improvement that was expected with the increase in fares effective last February. The number of passengers carried dropped 215,019 in April and 227,953 in May, compared with similar months a year ago. April cash fares of 10 cents were about 10 per cent of the 7-cent ticket fares. In May the cash fares numbered 140,478, compared with 1,299,772 7-cent ticket fares.

Hears Discontinuance Petition.—A hearing was held before the Public Service Commission on June 29 on the application of the Fonda, Johnstown & Gloversville Railroad for permission to discontinue about 2.08 miles of its line in the city of Amsterdam, N. Y. The proof on the part of the company was to the effect that the operation of this portion of its line was not profitable and that this condition had continued for several years. Objection to the abandonment was advanced by the city of Amsterdam. A further hearing on the matter will be held on July 9.

Surplus in 1925.—The Bakersfield & Kern Electric Railway reports to the California Railroad Commission its 1925 operating revenue at \$106,772, compared with \$97,821 for 1924. The operating expenses, excluding taxes, for 1925 are reported at \$99,268, and for 1924 at \$96,108, leaving net operating revenue of \$7,504 for 1925 and \$1,713 for 1924. During 1925 taxes charged to operation amounted to \$7,164 and for 1924 to \$7,740. Deducting the taxes leaves operating income of \$340 for 1925 and \$6,026.81 (deficit) for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income available for surplus of \$340 for 1925 and a deficit of \$5,976 for 1924.

Heavy Loss on New Hampshire Line.—The Manchester & Derry Street Railway, owned by the Manchester Traction, Light & Power Company, Manchester, N. H., is seeking to abandon its 8 miles of line in Manchester on which \$141,869 has been lost in recent years.

No Action on Worcester Dividend.—The Worcester Consolidated Street Railway, Worcester, Mass., at a recent meeting of the directors took no action on the payment of the usual semi-annual dividend. It is likely the payment will be passed at this time. Extraordinary expenditures for maintenance have cut greatly the net earnings of the road.

Net Income Lower.—The passenger revenue on the Brooklyn City Railroad, Brooklyn, N. Y., for the eleven months period ended May 31, 1926, was \$10,430,556, against \$10,402,860 for a similar period in 1925. The operating expenses and taxes fell off from \$8,929,151 to \$8,892,381 for the eleven months period ended May 31, 1926. After the consideration of income deductions the net corporate income was \$1,321,424 for this year's period, against \$1,388,163 for a similar period ended May 31, 1925.

Earnings Off in Akron During Strike Period.—In its report of earnings for May, 1926, the Northern Ohio Power Company, Akron, Ohio, attributes the decrease during that month as compared with May, 1925, to the walk-out on May 1 of some of the railway employees who returned to work on May 22. Gross earnings decreased from \$941,541 in May, 1925, to \$875,714 in 1926. Net income available for retirement reserve and corporate purposes in May, 1925, was \$61,837, while in May, 1926, there was a deficit of \$50,153. It is estimated that the decrease in passenger and freight receipts during May attributable to the strike amounted to \$156,908.

Legal Notes

ALABAMA—Duty to Person Driving Automobile on Parkway

A person driving an automobile along the track laid in a parkway or reservation was struck by a trolley car. There was a mist at the time. The driver was held to be a trespasser and that the company owed him no duty except the exercise of due care upon discovering his peril. As the motorman was under no duty to be on the lookout for a trespasser, no presumption could arise that he was looking ahead. The fact that the roadway on each side of the reservation was torn up for repaving was no legal excuse for the use of the track by the automobilist. [Snyder vs. Mobile L. & R. Co., 107 Southern Rep., 451.]

IDAHO—Constitutionality of Auto Bus Law Upheld

Idaho has a law requiring auto transportation operators to take out surety bonds for amounts depending on the capacity of the vehicle operated, to pay 5 per cent of their gross earnings to the state to be used for the maintenance of the highways and other provisions. School buses, motor cars or engines on steam or electric railroads, and companies operating exclusively within the corporate limits of cities are not included within the law. The constitutionality of this act was upheld by the Supreme Court. [Smallwood vs. Jetter, 244 Pacific Rep., 149.]

KENTUCKY—Duty to Passenger Boarding Car at Terminal Station

A carrier operating a terminal station to which passengers are admitted through turnstiles where they pay their fare before entering owes the same duty to passengers as a carrier operating a similar elevated or subway station. The highest degree of care should be taken to protect him when he is about to board the car from injury caused by pushing crowds. This is especially true at those times when the company should know from experience that large, boisterous and jostling crowds are to be expected. [South Covington & C. Street Railway vs. Vanice, 277 Southwest. Rep., 116.]

MAINE—Relief from High Local Tax Assessments.

A taxpayer whose property is taxed at 100 per cent of its true value while that of others is taxed at a lower percentage is entitled to have his assessment reduced to the percentage of value at which other property owners are taxed, but his claim of discrimination must be supported by "something which in effect amounts to an intentional violation of the essential principle of practical uniformity." [Cumberland County P. & L. Co. vs. Inhabitants of Hiram, 131 Atlantic Rep., 594.]

MASSACHUSETTS—Evidence in Action for Malicious Prosecution.

A railway company instituted criminal proceedings against a one-man car operator, accusing him of larceny by

retaining fares received by him, but he was acquitted. He then sued the company on the ground that it had acted maliciously and without probable cause for believing him guilty, and he received judgment. In this trial, the railway company took certain exceptions, one being to the exclusion of testimony of the division manager that on days when the plaintiff was laid off the receipts from the car were considerably greater than those turned in on the corresponding days when he was working and to the exclusion of the testimony of the assistant general manager that he had given this fact consideration in deciding whether to authorize the prosecution. The Supreme Judicial Court held that the exclusion of the testimony of the assistant general manager was wrong, whether the reports were false or not, as they influenced his judgment in deciding he had probable cause to believe the plaintiff guilty. The exceptions were therefore sustained. [Clark vs. Eastern Mass. St. Ry., 150 Northeast Rep., 184.]

MICHIGAN—Passenger Injured by Tort of Fellow-Passenger

Where a passenger was injured by the tort of a fellow passenger, the carrier can be charged only with the neglect by the conductor of some duty owed to the passenger arising from facts known to the conductor, or which in the discharge of his duties he ought to have known. Where a passenger tried to open the door between a compartment of a car at a place other than the regular stopping place, was assaulted by a fellow-passenger, fell against the glass in the door and cut his wrist, a verdict for the defendant was properly directed. [Takacs vs. Detroit United Railway, 207 Northwest. Rep., 907.]

MISSOURI—Excessive Speed of Car Is Negligence

An intending passenger crossed a street in front of a car thinking it would stop at an earlier corner before it reached the one at which he intended to board the car, but it did not so stop, and he was injured. The car's speed exceeded the 15 m.p.h. permitted under the city ordinance. It was held that this fact would entitle the plaintiff to recover damages, if it was the proximate cause of the injury. [Unterlacher vs. Wells, 278 Southwest. Rep., 79.]

NEW JERSEY—Land Owned by Railroad Next to Right-of-Way and Rented Held Subject to Jurisdiction of Public Utility Commission

A steam railroad owned property adjoining its right-of-way and rented it to a coal and lumber company. Later, an electric railway received permission from the Public Service Commission to make a physical connection with the steam railroad across this leased property. The Court of Errors and Ap-

peals upheld this order on the ground that the steam railroad could not contract away its liability to perform a public duty. The electric railway must bear any reasonable expense called for by this connection. [C. & M. County Traction Co. et al. vs. Board of Public Utility Commissioners et al., 132 Atlantic Rep., 118.]

NEW YORK—Plaintiff Can Examine Motorman

It was held that a plaintiff in a personal injury case is entitled to examine the particular employee of the defendant who is most familiar with the condition of the alleged effective appliance, where an important feature of the case was the question of the condition of the brakes and appliances. [West vs. Coney Island & B. R. Co., 114 N. Y. Sup., 475.]

OHIO—Requirements on Bus Franchises Upheld

An Ohio statute says that motor transportation companies "may" file applications with the Public Utilities Commission for changing, extending or shortening their routes, increasing or decreasing the number of vehicles, etc. The word "may" in this statute was declared by the court to be equivalent to "must." The statute also required the company to secure permission from the commission for the issue of capital obligations. Where this was not done, the court held that it might be overlooked at the discretion of the commission. [Cincinnati Traction Co. vs. Public Utilities Commission of Ohio, 150 Northeast Rep., 308.]

OHIO—Issue of Bus Certificate by Commission Voided

If the Public Utilities Commission should grant a certificate on the convenience and necessity of a new bus route without due notice and hearing, as provided by the code, the grant is void. [Columbus R. P. & L. Co. vs. Public Utilities Commission of Ohio, 150 Northeast. Rep., 237.]

PENNSYLVANIA—Terms of Rider in Accident Policy Covering Buses Held Not Controlling

A transportation company took out insurance on six buses with an oral agreement that it would receive credit for periods exceeding ten days in which any of the buses was not in use. At first the insured notified the insurer after the bus had been out of use for the period mentioned and would receive a credit memorandum therefor. Later, at the request of the insurance company, a form was used in which the number of the bus not in use was mentioned, and it was stated that the policy ceased as regards that bus. The transportation company understood the use of this memorandum to be for book record only and that all buses in operation were covered. Later, an accident occurred to a bus which the insurer had been notified had been withdrawn from service, but through an oversight on the part of the bus company, no notice was sent to the insurer that this bus had been replaced in service. The insurance company was held liable for the insurance under the policy. [Schuylkill Transportation Co. vs. London G. & A. Co., 131 Atlantic Rep., 701.]

Personal Items

John W. Carpenter Heads Dallas Railway

Review of Changes Made Recently in Personnel of Texas Road—

C. W. Hobson Returns to Commercial Pursuits—

Richard Meriwether Vice-President

OF GREATER interest than the brief mention made of them in the *ELECTRIC RAILWAY JOURNAL* for June 19, page 1079, are the changes in personnel of the Dallas Railway, Dallas, Tex., the most important of which resulted in the withdrawal of C. W. Hobson as chairman of the board, the elevation of John W. Carpenter to the post of president, a position vacant for some time, and the continuation of Richard Meriwether, long general manager of the company, in that post and as vice-president.

both companies to operate under new franchises.

Mr. Hobson was requested by the General Electric Company to head the railway. In the negotiation of the franchises there were numerous contracts, commitments and promises made—some definite, others informal. So Mr. Hobson set about the task he did so well. For about eight years he functioned as head of the railway. Then on Dec. 31, 1924, the General Electric Company disposed of all of its interest in Dallas Railway and, all of its promises,

business in Corsicana in 1900. He later was made general superintendent of the power and light and street railway company there and worked for some of the large electric companies in New York and Ohio, for a time with the Northern Ohio Traction Company. Later Mr. Carpenter returned to Corsicana and was made president and general manager of the Corsicana Light & Power Company.

The late Col. J. F. Strickland, pioneer in the electric power and light business in Texas, made Mr. Carpenter vice-president and general manager of the Dallas Power & Light Company in 1918. He occupied this position until 1919, when he became vice-president and general manager of the Texas Power & Light Company.

Mr. Carpenter is a member of the board of regents of the Texas Technological College at Lubbock. He is also a member of the board of directors of the East Texas Chamber of Commerce and vice-president of the Cotton Palace at Waco. Mr. Carpenter has been active in the movement for the in-



J. W. Carpenter



C. H. Hobson



Richard Meriwether

A lot of water has gone over the dam in Dallas since Mr. Hobson in 1916 was induced to try to avert the disaster that threatened the electric railways there. But men are part and parcel of the times in which they move. So the need arises to recount in part how it was that Mr. Hobson, who probably had little natural desire for the job, was in a sense commandeered as the one local man qualified to make the Dallas utilities local institutions and to restore the local transportation system to public confidence.

In 1916 the General Electric Company, though a subsidiary, owned a substantial but minority interest in the Dallas Electric Company of Maine, which controlled the Dallas Electric Light Company, three street railways operating in Dallas east of the Trinity River, and the Interurban Terminal property. The Oak Cliff lines were controlled by other interests.

The Mayor of Dallas requested the General Electric Company to acquire control of the Dallas Electric Company and the Oak Cliff street railway line, organize two separate Texas companies, one to operate the light and power property and the other all electric railway facilities in the city limits of Dallas—

contracts and commitments, having been fully complied with, Mr. Hobson felt that it was no longer necessary or desirable that he, as Southwestern manager of the General Electric Company, should continue as an officer in the railway. In consequence he tendered his resignation as a director and chairman of the board of directors of the railway.

Mr. Hobson, besides being the Southwestern manager of the General Electric Company, is a director in the Texas Electric Railway and the Texas Interurban Railway. He is chairman of the board of directors of the Southwest General Electric Company.

A native of Savannah, Mo., after coming to Texas he founded the Hobson Electric Company of Dallas and Houston and became its president and general manager. As early as 1888 he was identified with electric railway work at St. Joseph, Mo., as treasurer of the railway there. He is an active member of several civic and social organizations. He has held the office of vice-president and director of the Dallas Chamber of Commerce.

Mr. Carpenter was born on a farm in Navarro County. He started his career in the electric light and power

dustrial development of Texas through the upbuilding of the textile industry of the State.

Mr. Meriwether, in addition to directing the street railway operations in Dallas, is vice-president and general manager of the Texas Interurban Railway. He went to Dallas in 1911 as superintendent of a local holding of the Stone & Webster corporation. Upon the merger of the railways in Dallas in 1917, Mr. Meriwether became general manager of the new concern, which continues as the Dallas Railway.

J. C. Madigan Retires at Grand Rapids

John C. Madigan, veteran superintendent, whose span of service with the Grand Rapids Railway, Grand Rapids, Mich., and its predecessors has covered every type of railway vehicle from horse cars, cable cars and trolley cars to the present de luxe electric rail coaches, has tendered his resignation to L. J. DeLamarter, general manager. He will retire on Aug. 1.

Mr. Madigan has spent 38 years in the employ of the Grand Rapids Rail-

way. He will now devote his time to his big stock farm on the Rouge River, near Rockford, Mich., and to his other interests. His successor has not been appointed.

Mr. Madigan entered the service of the Valley City Street & Cable Company in May, 1888, at the time the cable company began operations. Two years later, on Aug. 1, he was made division superintendent and continued in executive capacities with that corporation and its successors, the Consolidated Street Railway and the Grand Rapids Railway. In 1900 he was made superintendent of transportation and six years later was promoted to general superintendent, a position which he held for two decades.

John G. Baukat Appointed to New Work

John G. Baukat, well known in the electric railway field, has been appointed vice-president and sales manager of the Woonsocket Manufacturing Company, Providence, R. I. Mr. Baukat's office will be located in the Grand Central Terminal Building, New York City.

Since early in the present year Mr. Baukat has served in the capacity of consulting engineer for the New York Railways. In fact, for the past few years he has been occupied in general consulting engineering work, principally in designing and superintending the building of trolley car equipment. He was affiliated for two years with the Batavia Car Works, which he organized and operated. In his very active career Mr. Baukat has been affiliated with several manufacturing concerns, among them the General Electric Company and the National Steel Car Company, Hamilton, Ont. In the operating end many companies have had his services. They include the Hydro-Electric Power Commission, the Lehigh Valley Transit Company and the Schenectady Railway. Some years ago he was connected with Day & Zimmermann, Philadelphia, public utility operators.

R. P. Stacy, formerly of Pittsburgh, has been made vice-president and general manager of the West Virginia Utilities Company, Morgantown, succeeding Joseph K. Buchanan, resigned. Mr. Stacy, accompanied by C. C. Gillette, another official of the company, arrived in Morgantown late in June and immediately entered upon the discharge of his duties. Mr. Stacy is a graduate of North Carolina State College. For a number of years he was with the Westinghouse interests and later became associated with the Duquesne Light Company, Pittsburgh, Pa.

S. Gordon Gale, Ottawa, Ont., vice-president and general manager of the Hull Electric Company, has been appointed to the position of general manager of the Gatineau Power Company, a subsidiary of the Canadian International Paper Company. Mr. Gale's appointment will not affect his position with the Hull Electric Company, which is a subsidiary of the Canadian International Paper Company. Mr. Gale is an outstanding figure in electric railway and power circles in Canada and the

United States. He is a former president of the Canadian Electric Railway Association. The Gatineau Power Company was organized to control the power developed by the Canadian International Paper Company on the Gatineau River.

W. W. Foster Heads New York Association

W. W. Foster, secretary-treasurer and general manager of the Rochester, Lockport & Buffalo Railroad, Rochester, N. Y., was elected president of the New York Electric Railway Association at the annual meeting at the Hotel Champlain, Bluff Point, N. Y., on June 25. Mr. Foster is very well known in New York State, not only for his association with electric railway activities but also for his banking and business affiliations.

At the age of sixteen he entered the employ of the First National Bank of Syracuse as a clerk. Two years later he entered the service of Holden & Sons, wholesale coal dealers, as an ac-



W. W. Foster

countant and cashier. In 1905 he became identified with electric railway interests when he went with the Beebe Syndicate as general auditor and assistant treasurer. This syndicate operated five interurban electric railways, including the Buffalo, Lockport & Rochester Railway, which was taken over in 1911. In the railway field Mr. Foster seemed to have found his chief interest. In June, 1915, the Buffalo, Lockport & Rochester Railway was segregated from the Beebe Syndicate and at that time he became auditor, secretary and treasurer, moving his offices to Rochester, N. Y. A little more than two years later he was appointed general manager of the company, but still retained the position of secretary-treasurer. In April, 1919, the company was reorganized and the name changed to the Rochester, Lockport & Buffalo Railroad Corporation. Then it was that he was elected a director and appointed to the positions of secretary-treasurer and general manager. These positions he still holds.

In addition to his railway work Mr. Foster has retained his banking affiliations and is a director of the Union Trust Company, Rochester. He was born in Syracuse on Jan. 1, 1873.

Obituary

Bert Weedon

Bert Weedon, a director of the Interstate Public Service Company, Indianapolis, and traffic manager for the company, which operates interurban and light and power utilities in Indiana, died recently in an Indianapolis hospital. He had been in ill health for some time. Funeral services were held June 28, with the Knights Templars in charge. Burial was in Indianapolis.

Mr. Weedon was widely known in public utility circles of Indiana. Practically all his life, since early boyhood, was devoted to public service corporation work. He joined the staff of the Interstate company as traffic manager in May, 1913. Prior to that time he was in the service of the New York Central Railroad at Terre Haute, Ind. That company sent him to the University of Michigan, where he completed his education.

Harry Reid, president of the Interstate, said:

Mr. Weedon was one of the most loyal and valuable members of the staff. We were close friends and his duties as a director of the company and traffic manager brought us in close contact. His death is a loss of an efficient and valuable officer and associate.

Mr. Weedon had unbounded faith in the interurban electric railway. He went after business intensively and he understood the value of good public relations. The road with which he was associated was one of the most intensively developed of its kind in the United States, doing an immense freight business and being distinguished for the quantity and the quality of its passenger services, which included parlor, dining and sleeper car accommodations. For this development there was sufficient reward to go around, and the officers of the company were not either slow or loath to acknowledge the part that Mr. Weedon played in advancing ideas for successful application in connection with the development of this service—a service of singularly outstanding merit.

In 1924 Mr. Weedon was a member of the committee on the development of new business of the American Electric Railway Transportation & Traffic Association, and in 1925 of the committee on selling transportation of that body.

Mr. Weedon was born at Murfreesboro, Tenn., 44 years ago. His parents died when he was a child and he went to live with an uncle in Logansport. He is survived by his wife and three children.

W. S. Hamilton

William S. Hamilton, superintendent of stores for the New York State Railways, and brother of James F. Hamilton, president of the company, died at Syracuse after an illness of ten weeks.

Mr. Hamilton entered the employ of the railway at an early age, and served in many capacities. At one time he was president of the Schenectady Railway. He has lived in Utica, Schenectady, Syracuse and Rochester, while serving in the railway companies.

Mr. Hamilton was on a business trip to Rochester when stricken with apoplexy.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Bids Asked for 100 Buses for Buffalo

Mayor Frank X. Schwab of Buffalo, as commissioner of public safety, has asked for bids to be submitted on or before July 6 for 100 single-deck buses in lots of 25, 50 or 100, of 26 to 30 passenger capacity with one or two-man control or both; also for 100 double-deck buses in lots of 25, 50 or 100 of 50 to 56 passenger capacity with one or two-man control. Bidders must submit their own specifications. Where possible, bidders are requested to furnish five or ten buses for operation and demonstration purposes, when required. No proposal will be considered unless accompanied by a certified check drawn for 10 per cent of the amount bid, or, in lieu of such check, by a bond conforming to law, such bond to be equal to 50 per cent of the sum named in the proposal. Proposals should be marked, "Proposals for Motor Buses."

This request for bids marks a step by the city to start municipal bus operation in opposition to the service now being given by the International Bus Corporation, a subsidiary of the International Railway. The legality of the

plan of the City Council is questioned by the city law department, but Mayor Frank X. Schwab says a transportation emergency exists. He is anxious to have the plan to establish municipal bus routes placed before the courts, if necessary.

Plant to Reconstruct Railway Track Equipment Is Planned

Within a few days work will be started on the erection of a modern steel and concrete factory building at Indianapolis by the Morrison & Risman Company, Inc., of Buffalo, N. Y., for the reconstruction of railway track equipment, it was announced by R. L. Morrison, vice-president and treasurer of the corporation. The new plant will house machinery of the latest pattern for the reconstruction of frogs, switches and similar track equipment. F. C. Cullen, who will be the manager of the plant, accompanied Mr. Morrison to the city and assisted him in making arrangements for the erection of the building. The site on which the plant will be erected is 650 ft. long and 105 ft. wide. Recently the company, which has been in business in Buffalo for 38

years, placed a second plant in Chicago, due largely to the expansion of the business in the Middle West. The new plant was so successful that after six months of business it was decided that another new plant and branch office in Indianapolis was needed.

Noiseless Car Is Exhibited

As a means of increasing public interest in transportation affairs, the Twin City Rapid Transit Company, Minneapolis, Minn., recently entered one of the noiseless street cars which it plans to put in service in the Twin Cities in the St. Paul Products Show, recently held at one of the St. Paul department stores. This show inaugurated the home products display and sales plan being conducted in the Minnesota city. The car that was exhibited weighs approximately 25,000 lb., is equipped with noiseless roller bearings and brake bands, as well as an improved type of spring to insure a maximum of easy and quiet riding.

Applicants Rush to Exhibit at Cleveland

American Electric Railway Association
Reports About 101,302 Sq.Ft. of
Space Sought on July 1

Space for the monster exhibit to be held at the meeting of the American Electric Railway Association in Cleveland, Ohio, starting on Oct. 4, will be assigned by the exhibit committee of that body at a meeting called for July 8. Up to the close of business July 1, applications had been received from 190 member companies for about 101,302 sq.ft. of space. There were also nine applications asking for 670 lin.ft. of track space.

Transportation experts from all parts of the world will attend the meeting and examine the display because they look upon the exhibit as reflecting the latest developments in both rail and non-rail vehicular transportation. Records established in Atlantic City for the exhibition of the latest types of electric railway cars are expected to be broken. Special track has been provided adjoining the exhibition hall on which to show this equipment. Applications have already been received for the display of typical passenger cars and for showing dump cars, crane cars, concrete breakers, freight cars and even refrigerator cars. It will be a live exhibit, in that the cars will be served with current to permit the operation of all the automatic devices with which they are equipped.

No phase of up-to-date operation is likely to be neglected. Although they are machines not easy to handle over a temporary track, it is expected that both oil-electric locomotives and gas-

Many Electric Locomotives Under Construction at Erie, Pa.



A RECENT view of the locomotive assembly shop of the Erie, Pa., works of General Electric Company, showing fifteen electric locomotives of various types in the process of being assembled. In front is an 80-ton switching locomotive. Next are four halves of the two freight locomotives for the New York

Central Railroad, and beyond these are five of the ten gearless passenger locomotives for the same railroad. Next in line are two New York, New Haven & Hartford switching locomotives, and in the far end of the long building are three of the new motor-generator type of locomotive for the same railroad.

	Booths	Total Sq.Ft.
Section A—Arena floor...	53	23,838
Section B—Exhibition hall	103	19,627
Section C—Auditorium's west wing...	148	62,077
Section D—Open air exhibition space	8	6,360
Section E—1,500 lin.ft. exhibition space.		
Total number of exhibition booths in Sections A, B, C, D, and E,	312	
Total number of square feet available	111,902	exclusive of track space.

electric rail cars will be shown. Reference was made in the ELECTRIC RAILWAY JOURNAL previously to some of the plans that had been developed for exhibiting the railway equipment.

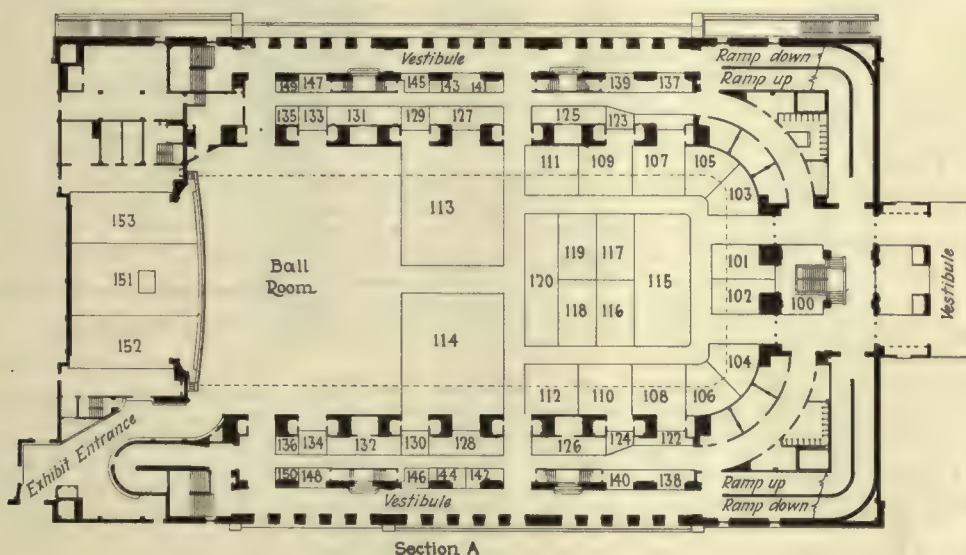
So far as the show of buses is concerned it is expected that the vehicles which will be displayed will outnumber and outrank in their variety similar

vehicles shown in previous years. The feeling prevails that the motor bus men this year should do more in the way of showing trucks and tractors than they have in the past. The suggestion has also been made that the automobile makers display taxicabs.

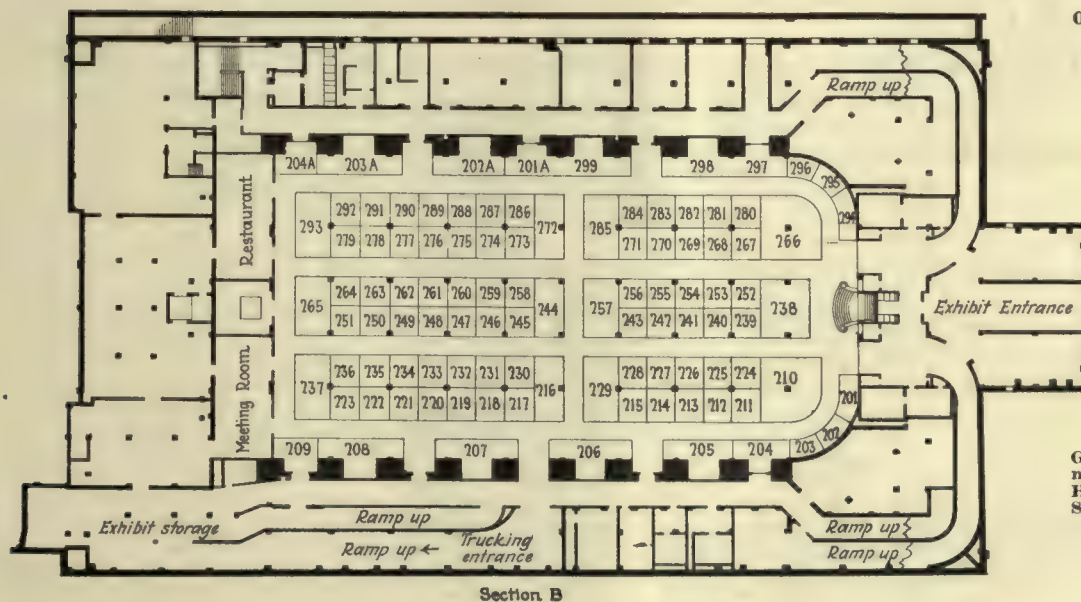
Nothing definite has been said about it, but it would not be surprising if

some planes were shown. At least one electric railway is now operating planes in regular service.

A recapitulation of the space available, with the total number of booths, and the number of square feet and an illustration showing the meeting hall and exhibition layout accompany this account.



On July 1
190 Applicants
Were Seeking
101,302 Sq.Ft.
of Space



General Arrangement of Meeting Hall and Exhibit Space at Cleveland

Some Recent Timken Company Changes

Phenomenal growth of sales of Timken bearings for industrial uses has brought about the promotion of G. W. Curtis from industrial equipment engineer of the Timken Roller Bearing Company, Canton, Ohio, to district manager of sales, industrial division, for the Milwaukee territory. Mr. Curtis will work with R. W. Ballentine, who previously has handled this territory. S. M. Weckstein succeeds Mr. Curtis as industrial equipment engineer. Mr. Weckstein has been notably successful in developing Timken bearing applications for precision work in machine tools and high-speed applications. G. W. Richards and A. R. Spicacci are appointed assistant industrial equipment engineers to assist Mr. Weckstein.

Other changes have recently been announced. H. E. Gilmore will become manager of the St. Louis branch of the Timken Roller Bearing Service & Sales Company.

The Omaha branch office of the Timken Roller Bearing Service & Sales Company, formerly located at 2524 Farnum Street, now occupies larger quarters at 2240 Douglas Street. Complete service stocks for authorized distributors will be maintained as in the past. The management will continue under the direction of A. D. Hackim.

The new home of the Los Angeles Branch of the Timken Roller Bearing Service & Sales Company will be at 1361 South Figueroa Street, moving to this location from 1241 South Hope Street.

Track and Line

Connecticut Company, New Haven, Conn., is planning to construct an additional track over Blue Hills Avenue from Westbourne Parkway to the turnout track north of Holcomb Street, Hartford. The street board and railways committee of the Common Council will, it is expected, grant the required permission.

Los Angeles Railway, Los Angeles, Cal., has started work at the Temple Block which will unite two of the oldest car lines in the city. The south layout of the special work on Main Street at the Temple Block will be relocated and new double tracks constructed west

therefrom to connect with the present terminal of the Temple Street tracks in front of the Federal Building. This work will necessitate the relocation also of the center line of tracks with respect to Main Street from this special work to a point about 125 ft. north. All other special work and curves at this location will be removed. The safety island in the center of the street will be completely reconstructed and the large island in front of the Federal Building will be removed. A new island will be built along the east side of the tracks on Main street, north from the new curves to Temple Street.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., is busy now with two paving jobs. There are 3,700 ft. of paving to be laid on King Hill Avenue. About 1,150 ft. of the concrete work has been completed and all the steel laid on the east track. The Francis Street project totals 1,800 ft. of paving.

Power Houses, Shops and Buildings

Georgia Railway & Power Company, Atlanta, Ga., has purchased a tract of land containing many acres, part of which, it is said, will be used as a site for a carhouse. The property is located near Atlanta adjacent to the West Point belt line.

Birmingham Electric Company, Birmingham, Ala., will start work shortly on the construction of a two-story and basement building to be used as a warehouse and offices for linemen, construction crews and other employees. The new building will cost approximately \$350,000.

Rockford City Traction Company, Rockford, Ill., through Receiver Adam Gschwindt, was authorized by Judge E. D. Shurtleff, in the Circuit Court, to expend \$72,000. Of this amount \$50,000 is for the completion of Seventh Street paving and track laying and \$7,000 is for North Second Street track laying.

Trade Notes

American Engineering Company, Philadelphia, announces the appointment of H. Kempner as sales manager of its "Lo-Hed" electric hoist division. Mr. Kempner has been in charge of sales promotion work for the American Engineering Company, including the handling of its advertising and publicity, for the last three years. He studied electrical engineering at Harvard University and for four years was an instructor in physics at Pratt Institute, Brooklyn, N. Y. He formerly was connected with the engineering department of the Western Electric Company in New York. From 1919 to 1923 Mr. Kempner was in the service of the McGraw-Hill Publishing Company, Inc., handling accounts in a number of papers published by this company, including *American Machinist*, *Electrical World* and *Power*. In 1920 he was sent

to Washington to organize and take charge of the disposal of surplus war property for the government. He was overseas from 1917 to 1919, participating in the Oise-Aisne and Argonne-Meuse offensives.

Monitor Controller Company, Baltimore, Md., manufacturer of automatic controllers and electrical resistors, has opened a branch office at Room 417, 136 Federal Street, Boston, Mass., with Nelson A. McCoy in charge. For the past eight months Mr. McCoy has been located at the main office of the company. Previous to joining the Monitor organization he was with the Wagner Electric Corporation for fifteen years. After completing this company's student course he was made foreman of its motor tests. In 1913 he was transferred to Wagner's Philadelphia sales and service organization and in 1921 was sent abroad, covering Hawaii, Australia and New Zealand.

John R. Lee has been appointed general sales manager of Dodge Bros., Inc., Detroit, Mich. Mr. Lee has been assistant general sales manager since last December, and prior to that served for several years as assistant to the president. Three new assistant general sales managers have been appointed to serve with Mr. Lee. They are: H. J. New, formerly director of distribution; W. M. Curves, former division sales manager, and F. R. Valpey, former director of the commercial car and truck division. Mr. New's duties will embrace agreements and distribution; Mr. Curves will be in charge of districts and field operations, and Mr. Valpey will concentrate on Dodge Brothers commercial car and Graham Brothers truck and bus sales.

New Advertising Literature

Nichols-Lintern Company, Cleveland, Ohio, has issued a booklet giving prices and specifications on various types of Nichols-Lintern Universal lanterns.

General Electric Company, Schenectady, N. Y., has issued bulletin GEA-380, describing Helicoil sheath wire units. This is a form of heating unit with protective casing. Nickel chromium wire is used as a conductor and it is surrounded by a compacted insulating powder so as to insulate it from the casing. The unit is flexible and can be bent into various shapes.

Ohmer Fare Register Company, Dayton, Ohio, has reprinted another early address by John F. Ohmer. It is entitled "Transfers, Their Use and Abuse," and was delivered before the Iowa Street Railway Association on April 16, 1906. It outlines the principal problems connected with the issue, collection and accounting for of transfers and then explains how these difficulties are overcome by the Ohmergraph, a transfer printing and issuing machine. A paragraph dated June 9, 1926, at the end of the paper, explains that the Ohmergraph referred to in this address was the first step in the evolution of the present Ohmer transfer machine, which prints all the required data on plain paper supplied to the machine in rolls, no punching or prepared transfer being necessary.

Metal, Coal and Material Prices

Metals—New York		June 29, 1926
Copper, electrolytic, cents per lb.	13.875	
Copper wire, cents per lb.	16.00	
Lead, cents per lb.	8.275	
Zinc, cents per lb.	7.52	
Tin, Straits, cents per lb.	61.75	
Bituminous Coal f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$4.425	
Somerset mine run, Boston, net tons	1.925	
Pittsburgh mine run, Pittsburgh, net tons	1.75	
Franklin, Ill., screenings, Chicago, net tons	1.70	
Central, Ill., screenings, Chicago, net tons	1.45	
Kansas screenings, Kansas City, net tons	2.425	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.25	
Weatherproof wire base, N. Y., cents per lb	18.00	
Cement, Chicago net prices, without bags	2.10	
Lined oil (5-bbl. lots), N. Y., cents per lb.	11.70	
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.00	
Turpentine (bbl. lots), N. Y., per gal.	\$0.89	

Study the "modern car" specifications—

Peacock Staffless Brakes are almost *always* there



The Peacock
Staffless

Miami Beach Railway, Miami, Fla., recently received twelve new cars. The specifications follow:

Builder of car body . . . Perley A. Thomas Car Works
Type of car . . .

Light-weight, double-truck, one-man safety
Seating capacity . . . 48
Total weight . . . 36,000 lb.
Bolster centers, length . . . 20 ft. 0 in.
Length over all . . . 45 ft. 9 in.
Width over all . . . 8 ft. 4 1/2 in.
Height, rail to trolley base . . . 10 ft. 11 in.
Body . . . All steel
Interior trim . . . Cherry
Headlining . . . 1/4 in. Agasote
Roof . . . Arch
Air brakes . . . General Electric
Bumpers . . . Channel
Car signal system . . .

Electric Service Supplies Company
Compressors . . . General Electric
Control . . . K-35
Curtain fixtures . . . Curtain Supply Company
Destination signs . . . Hunter
Door-operating mechanism . . . National Pneumatic
Fenders . . . Consolidated
Finish . . . Varnish
Gears and pinions . . . General Electric
Hand brakes . . . National Brake Company
Headlights . . . General Electric
Lightning arresters . . . General Electric
Motors . . . Four GE-265, 35 hp.
Registers . . . International
Sanders . . . Ohio Brass
Sash fixtures . . . O. M. Edwards
Seats . . . Hale & Kilburn
Seating material . . . Wood slat
Slack adjuster . . . American Brake Company
Step treads . . . American Abrasive Company
Trolley retrievers . . . Chas. I. Earll
Trolley base . . . Ohio Brass, Form 4
Trucks . . . Brill, 76-E-1
Ventilators . . . Railway Utility Company
Wheels . . . Pollak Steel Company 26-in.

In progressive cities, it is only natural that the specifications call for modern hand brakes. And of course they mean Peacock Staffless Brakes!

They have a demonstrated capacity for winding in 144 inches of chain—so that even though chains are slack and brake shoes worn, adequate braking power is assured at all times.

Both installation and maintenance costs are very low—as proved by actual figures, gladly sent on request.

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Studies on Financial and Physical Rehabilitation
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When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

INDUSTRIAL GASES

OXYGEN
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Quick shipment and low prices also on cylinders, valves, torches, regulators and supplies.

International Oxygen Co., Main Offices: Newark, N. J.

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A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we built. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut



Gets Every Fare

PEREY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

Perey Manufacturing Co., Inc.
101 Park Avenue, New York City

UNA

RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING ROD

UNA Welding & Bonding Co.
Cleveland, Ohio.



Type ATF-2

for bonding the ball of the rail.
Other types shown in Circular
No. 13.

It certainly does matter how good your bonding is!

The troubles due to poor bonding are many, indeed, tho how poor bonding produces them is not always so apparent. It is a fact, however, that poor bonding spells poor power, and cars behind schedule. Burned out armatures, flickering lights, and electrolysis troubles are also traceable to poor bonding.

Trade



Mark

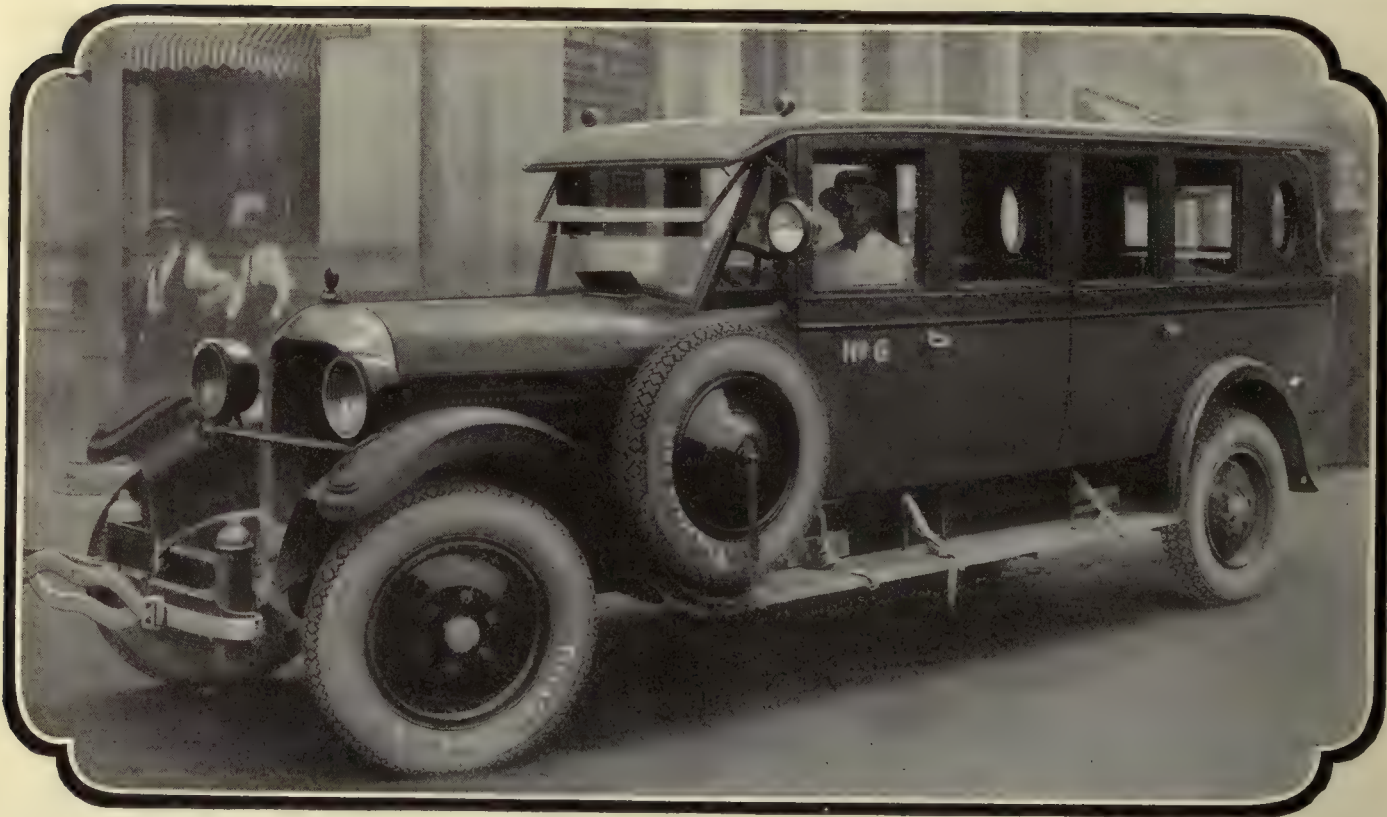
Arc Weld Rail Bonds

Will give you a permanently good return circuit and relieve your operating force from many of these troublesome worries. Not only will your service to your patrons improve, but your power and maintenance cost will be lower too.

Good bonding is not a cure-all, but it's a big factor in paying operation. The surprising part is how little good bonding, ERICO bonding, really costs.

Let us know to whom to send our Circulars Nos. 10 and 13 showing ERICO Arc Weld Bonds and Equipment. They point the way to more profitable operation.

The Electric Railway Improvement Co.
2070 East 61st Place, Cleveland, Ohio



True-to-Schedule Tire Service

Daily, in all weathers on all roads, Firestone Bus Pneumatics are giving reliable "true-to-schedule" service.

Gum-Dipping is largely accountable for this performance. This exclusive Firestone process insulates every fiber of every cord with rubber; minimizing friction and heat and building greater strength and flexibility which mean extra comfort for passengers and added prestige and patronage for the operator. The broad tread of this tire, with its great volume of rubber, affords deep cushioning—added protection to chassis and body.

Firestone Engineers are specialists in suiting the right tire to the truck or motorbus it must carry. Their advice, added to your dealer's knowledge of local conditions, insures you the equipment, which under all circumstances, will give most efficient service with the economy of—

MOST MILES PER DOLLAR



Firestone

TRUCK AND BUS PNEUMATICS

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER . . . *Harvey Firestone*

Light on the Bus Braking Question

The A B C's of Bus Brakes and Braking Systems

Curing the Skid

Skidding when brakes are applied can easily be cured. It is due, primarily, to the application of unequal braking pressures. One wheel absorbs most of the braking effect, becomes locked, and the vehicle pivots, with consequent loss of control, abrasion of tires, and strain on the chassis; if indeed nothing more serious in the form of an accident occurs.

While skidding may never be entirely eliminated, the most dangerous source of skids can be removed by using a braking system that automatically applies equal braking power to wheels on the same axle regardless of band wear, or any other such variable factor.

It is plain that such a system must transmit its power by a fluid—air, oil or a similar agent. It must apply its power directly, without the complication of levers, pull-rods, shafts, knuckles and cams. The greater the simplicity, the easier to maintain equal pressures.

In a brake system that uses fluid for power transmission, the pressures applied to the brake actuating mechanisms on the same

axle *have* to be equal. It is impossible that they be anything else. With the simplest possible brake operating mechanism,—without a lever, pull-rod, cam system—the ideal of a perfectly equalized braking pressure that automatically maintains its equalization is attained. IN NO OTHER WAY IS IT POSSIBLE.

Furthermore, perfect self-equalization of braking pressure makes possible employing the safe use of brakes on ALL wheels; distributing the braking load and making locked wheels far less likely.

Skidding when brakes are applied can be practically done away with, if truck owners select their brakes with an eye to what has been written above.

This is the fourth of an informative series on Bus Brakes. The series consists of:

- A—What Brakes Must Do.
- B—How many wheels should brakes go on?
- C—Self-equalization and brake adjustments.
- D—Curing the Skid.
- E—Metal to Metal or Moulded Linings—which?
- F—Braking Power.
- G—Compressor Mountings and Drives.
- H—Compressor Cooling.
- I—The Control Valve.
- J—Maintenance on Different Types.

The other topics will appear in the above order. Address any comments, suggestions, or requests for advance information to—

The Christensen Air Brake Co.
6513 Cedar Ave., Cleveland, Ohio

Christensen

Budd-Michelin Dual Wheels

put a bigger share of every fare into the profit column

VETERAN bus owners know from experience that Budd-Michelin Dual Wheels lengthen the profit column.

They know that a fleet with one-size wheels, one-size tires—all interchangeable—costs less to service.

And they know that Budd-Michelin Dual Wheels make it possible to get from 15,000 to 20,000 miles from a set of pneumatic tires—this has been the experience of more than 40,000 heavy buses.

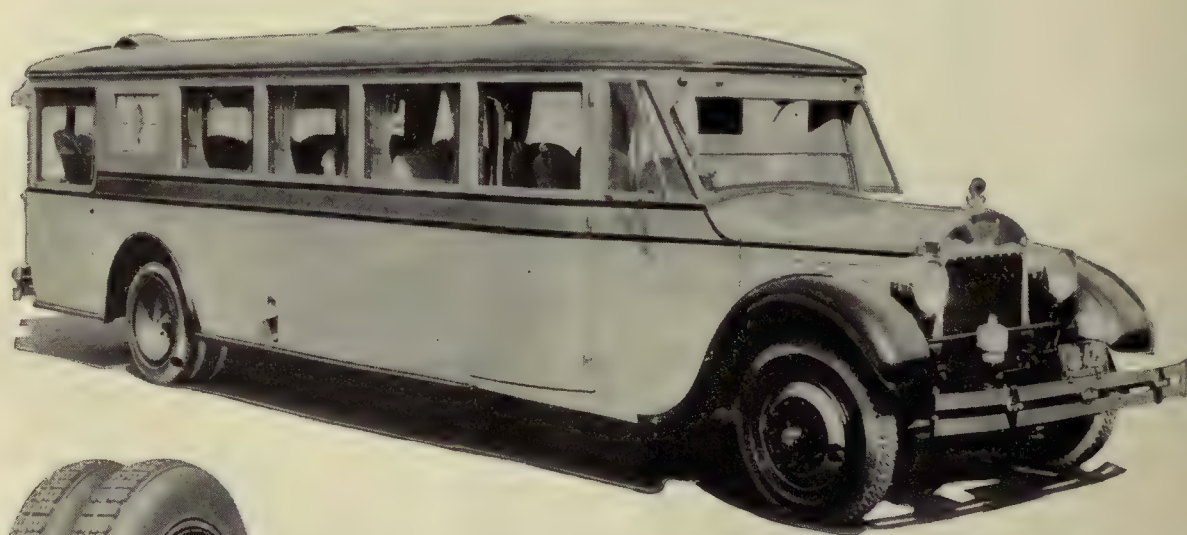
Budd-Michelin Dual Wheels have grown up with the bus industry. They made it possible for heavy buses to ride on pneumatics. They brought low-body suspension without interfering with seating capacity—made the heavy bus attractive to look at, comfortable to ride in.

Budd-Michelin means service economy, profitable tire-mileage, passenger-attracting comfort—and these factors are vital to any bus owner, whether he's buying his first bus or his hundredth.

BUDD

WHEEL COMPANY

Detroit



The Budd-Michelin equipment—two Budd-Michelin single wheels in front, two Budd-Michelin Dual Wheels in the rear (pairs of single wheels acting together as units). All wheels completely interchangeable either as units or as halves of Duals. One spare.

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More Frequent Service

A more frequent service can be furnished without excessive investment in equipment by selecting Graham Brothers Motor Coaches. Their low initial cost is made possible by large production.

Low operating costs result from the absence of excess weight, the economy of the Dodge Brothers engine and the rugged chassis and body construction. Moreover, the dependable performance of Graham Brothers Motor Coaches assures regularity of schedule.

21 Passenger
Street Car Type
Motor Coach
Complete,

\$3815

f. o. b. Detroit

GRAHAM BROTHERS

Evansville — DETROIT — Stockton
A DIVISION OF DODGE BROTHERS, INC.
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A 25-passenger bus equipped with the Baker-Raulang Luggage Loft carries 30 paying passengers, with no increase in wheel-base.

35 Square Feet of Expense or Thirty Five Square Feet of Revenue



Luggage has always been the necessary evil of bus operation. Now that's settled to the complete satisfaction of operator and passenger alike by the Baker-Raulang Luggage Loft.

THERE are actual, provable, money-in-the-bank advantages to the operator in new Baker-Raulang Bus Body design. For one—35 square feet of your bus floor is changed from expensive luggage-carrying space into profitable passenger-carrying space, by the exclusive Baker-Raulang Luggage Loft.

Above each passenger is a roomy compartment where suit-cases, bags, hat boxes can be carried, out of the way. Floor space formerly required for baggage is used for revenue-paying seats, and in addition the bus operator is relieved of all time and liability in caring for passengers' baggage, and passengers have their parcels easily available at any time on the journey.

The Luggage Loft allows ample room for inside storage yet leaves the aisle clear.

The convenient guide rail increases the comfort of passengers going to and from seats, and making possible the carrying of standees where regulations permit.

The Luggage Loft is only one of many Baker-Raulang improvements in bus body design—improvements that make good our promise to the industry—to promote public popularity. The new features are the result of long and careful study of the needs of the industry on the part of this veteran organization which for 73 years has been designing and building fine closed bodies for carriages, for the first closed automobiles, and now for buses.

We will gladly explain Baker-Raulang advantages to interested buyers, and apply our experience, study and facilities to the solution of your engineering and operating problems.

Bus Body Division, THE BAKER-RAULANG COMPANY, Cleveland, Ohio, U. S. A.

**Baker
Raulang**
BUS
BODIES

TRADE MARK



No. 7 of Inter Cities Coach Co. fleet, Dayton, Ohio

INTERNATIONAL HARVESTER MOTOR COACHES

*Are the Product of Tremendous Resources
and of 22 Years' Automotive Experience*

Manufacturers for nearly a century, motor truck builders for over twenty years, the International Harvester Company pioneered also in the designing of motor coaches. The earliest of its 6-cylinder conveyances are in highly profitable operation after six-figure mileage records, and the perfected chassis coming from the factories today are equipped in every detail to render utmost satisfaction to coach owners and drivers and—more important—to discriminating passengers. Mechanical excellence, beauty of line, and de luxe

appointments catering to the rider's comfort, have built a consistent high reputation for International Motor Coaches. The various bodies supplied for the 6-cylinder chassis carry 24 to 33 passengers. Regular equipment includes air brakes on all four wheels and every appointment detail known to highest-grade manufacture. The International SL 4-cylinder coach [12 to 14 passengers] offers advantages of flexibility and economy, either as main units or as auxiliaries to larger operating units.

Detail information on International Coaches—or trucks and industrial tractors—will be mailed on request

INTERNATIONAL HARVESTER COMPANY

606 So. Michigan Ave. of America
(Incorporated)

Chicago, Illinois

International Motor Trucks

A full line ranging from the $\frac{3}{4}$ -ton "Special Delivery" and 1-ton and 1½-ton Speed Trucks to the 5-ton Heavy-Duty Truck.

McCormick-Deering Industrial Tractors

Compact, flexible power units, ideal for many trailer-hauling jobs and for work around yards, plants, etc. Disk wheels, rubber tires, spring-mounted front axle, and 2, 4, and 10 m. p. h. forward speeds.

International Harvester offers you unparalleled automotive service, rendered through the world's largest Company-owned truck and coach service organization. Company-owned branches are now located at 120 points in the United States and 17 in Canada, and they are supplemented by the service of International automotive dealers.



Hollywood Subway ~

OHMER Equipped

REG. U. S. PAT. OFF.

Ten thousand fares are collected here daily and the amount of each fare is indicated and recorded on Ohmer Fare Registers. This is another demonstration of the flexibility of the Ohmer System of handling transportation sales, a method proved absolutely correct in principle and in practice by the most successful electric railway and motor bus companies.

It was natural that the Hollywood Subway should be equipped with Ohmer Fare Registers. It is a part of the great Pacific Electric Railway system which serves Southern California and its cities with the highest type of electric transportation and uses hundreds of Ohmer Fare Registers on its various divisions.

For more than a quarter of a century the Ohmer Fare Register Company has been serving the transportation industries with ever increasing effectiveness and with devices constantly improved to meet the most exacting requirements.

Ohmer Fare Register Company
DAYTON, OHIO, U. S. A.



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Gibraltars of Bus Transportation



GIBRALTAR Bodies are universally recognized because each step in design and construction has been taken in strict conformity to the ethics of correct engineering, masterly workmanship and good taste, combined with quantity production.

It is with pride that the builders of Gibraltar bodies have found rewards for their efforts in the steadily increasing demand from leading chassis builders and operators in the bus industry.

Today - the Gibraltar of the Bus Body Industry

THE AUTO BODY COMPANY

LANSING, MICHIGAN



Designers and Manufacturers of Motor Coach and Bus Bodies ~ Open and Enclosed Automobile Bodies

COLD DRAWN— TROLLEY POLES



“NATIONAL-SHELBY” Seamless Steel Trolley Poles are cold drawn from a selected grade of basic Open Hearth steel low in phosphorus and sulphur.

“NATIONAL-SHELBY” Poles are manufactured by the seamless process—from a solid billet—with no weld or brazed joint to weaken its strength.

“NATIONAL-SHELBY” Poles are finished to size and taper desired by cold drawing.

Prior to the last cold drawing operation, they are given a special heat treatment which leaves the grain of the steel in the finest condition.

The result is a pole of maximum strength and elasticity with minimum weight.

Details regarding manufacture and tests are given in a booklet, entitled: Seamless Cold Drawn Steel Trolley Poles.

NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES IN THE LARGER CITIES

HASKELITE

HASKELITE
the engineering plywood. Specified on recent Lightweight Noiseless orders from the Tennessee Electric Power Company, The Nashville Railway & Light Company, The Southern Indiana Gas & Electric Company, etc.

Light Weight Noiseless car built for Grand Rapids Railway, of same type as recent orders mentioned herein. Has HASKELITE roofs, interior panels and bulkheads.



Lightening the Weight of the Light Weight Car

THE demand for lower operating costs has forced car designers and railway officers to develop modern types of street cars which are materially lighter than standards of even a decade ago.

But there is another factor in cutting out useless dead weight. That is the selection of materials best adapted to the modern type of construction. When you buy new light weight cars or remodel old ones, why not take advantage of the progress made in producing light weight materials for this purpose. HASKELITE and PLYMETL have no equal in this respect. In addition to their light weight these materials are strong, will take a fine finish, require little maintenance, provide desirable insulation, etc.

A list of the prominent users and a blueprint booklet showing detailed applications to street cars and buses will be gladly sent on request.

Haskelite Manufacturing Corporation
133 W. Washington Street, Chicago, Illinois

PLYMETL

steel faced plywood. Specified on recent Lightweight Noiseless orders from the Tennessee Electric Power Company, The Nashville Railway & Light Company, The Southern Indiana Gas & Electric Company, etc.

PLYMETL



Representative Properties Adopt Bates Poles

The wide general acceptance of Bates poles and supporting structures by leading transportation companies, both in this country and abroad, is significant of the superiority of this form of overhead support. Bates Poles possess unique advantages over other types, and are now available at remarkably low first cost. Their qualities of strength and durability affect substantial economies over long periods of time. Secure a Bates estimate on your projected construction.

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*Specify
Bates*

B E S T Bates Expanded Steel Truss Co.
Sales, Engineering and Executive Offices
EAST CHICAGO, INDIANA



More Revenue?

Ans.—Modern Cars!

Profits depend largely upon revenue—and modern, attractive cars have proved themselves a productive source of increased revenue. The car that offers comfortable, quick and convenient service will always successfully compete with other modes of transportation.

Will you give us the opportunity of assisting you in the development of new, attractive and profit-earning cars?

Cummings Car and Coach Company

Successor to McGuire Cummings Mfg. Co.

111 W. MONROE ST., CHICAGO, ILL.

Light Weight City and
Interurban Cars
Single and Double Trucks

and—the Cummings Gas-Electric Motor Coach

PIN TERMINAL RAIL BONDS



View of 20th Century rounding bend at Marblehead. The New York Central is always among the leaders in modern equipment. Insert shows our type CPOI Bond used on all main line tracks

BECAUSE of the ease of installation, Pin Terminal Rail Bonds are used on many of the larger railway systems. They are accessible for inspection, show low maintenance cost, insure strong contact and low resistance.

The American Steel and Wire Company has a rail bond for every requirement. Our engineers will be glad to assist you in selecting the best bond for your needs.



American Steel & Wire

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CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST. LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY.
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Strength

... an outstanding characteristic of Durable Douglas Fir

THE strength and stiffness of Douglas Fir long ago established this unusual wood as standard material for dredge spuds from the Great Lakes to the Gulf.

Douglas Fir is strong, durable and dependable. Available to the engineer in any size and grade, Douglas Fir structural timbers can be depended upon to give unusual service.

"As a structural timber Douglas Fir is not surpassed" so states the U. S. Forest Service in Bulletin No. 88.

Douglas Fir is strong and stiff, under either static or impact loading. In Technical Note No. 119, the U. S. Forest Service concludes that insofar as strength properties are concerned, the choice between any two lots of Douglas Fir and its closest rival will depend upon the grade and density of the timber composing each lot.

Strength, great stiffness and unusual durability, combined with the large dimensions that are available, place Douglas Fir at the head of the list.

And Douglas Fir is always durable. The U. S. Forest Service in Technical Note No. 173 asserts that Douglas Fir is only a little less durable than White Oak, and rates select material of Douglas Fir on a parity with the King of Hardwoods.

- | | |
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| 1. Piling and poles | 16. Foundation material |
| 2. Cross arms | 17. Flumes |
| 3. Railway ties | 18. Bridges and trestles |
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—and for every engineering purpose where wood is the best material

An illustrated booklet, "Durable Douglas Fir—America's Permanent Lumber Supply," sent on request. This hand book contains valuable information for you. Use the coupon or mail a postcard.

Durable
Douglas Fir
AMERICA'S PERMANENT
LUMBER SUPPLY

WEST COAST LUMBER BUREAU,
5562-T STUART BUILDING, SEATTLE, WASHINGTON

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Gentlemen: Please send me a copy of your free booklet, "Durable Douglas Fir—America's Permanent Lumber Supply."

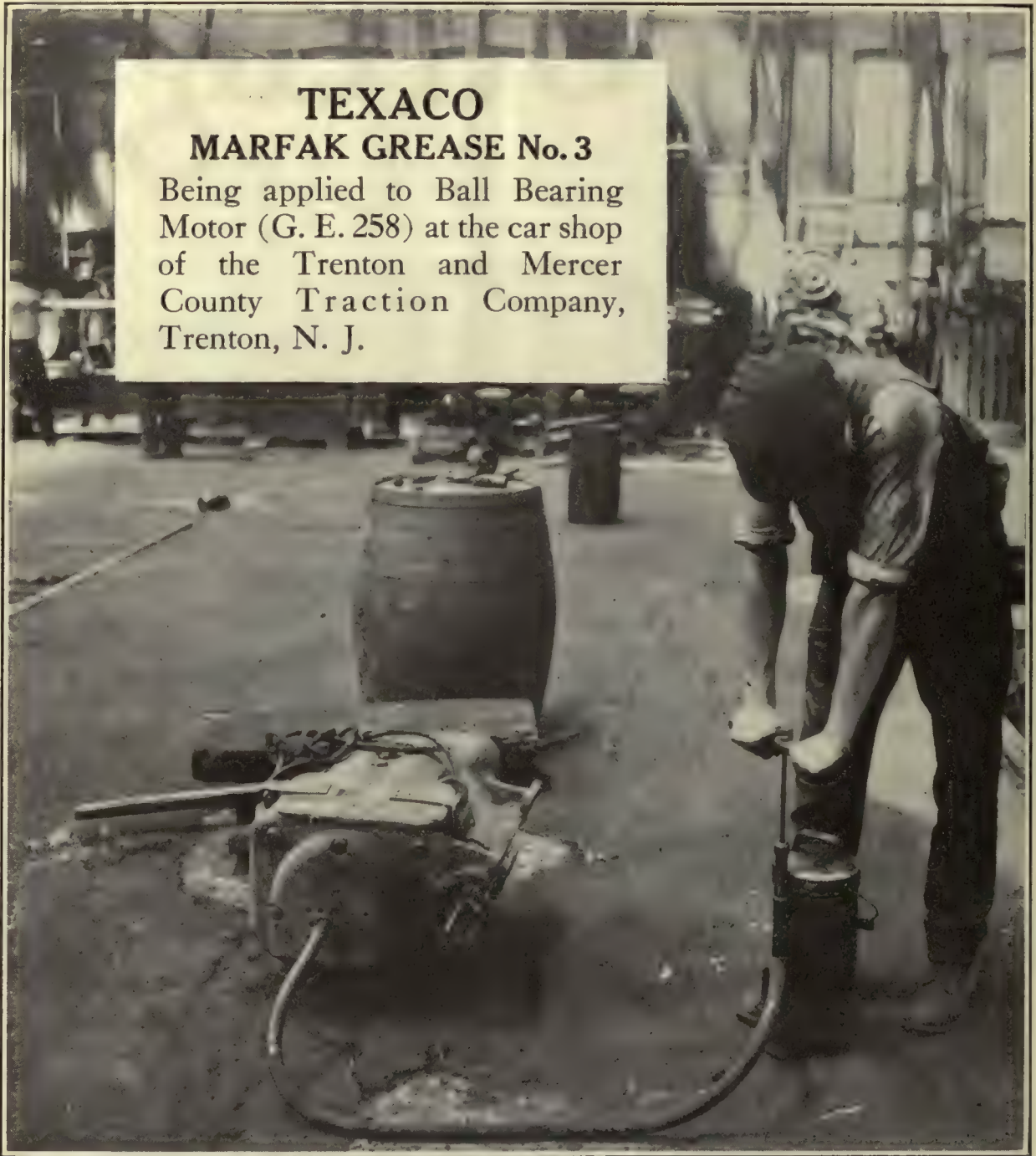
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TEXACO**MARFAK GREASE No. 3**

Being applied to Ball Bearing Motor (G. E. 258) at the car shop of the Trenton and Mercer County Traction Company, Trenton, N. J.



TEXACO



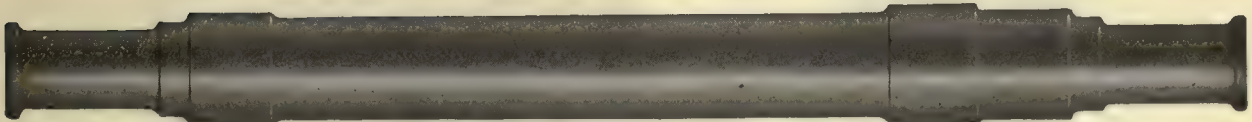
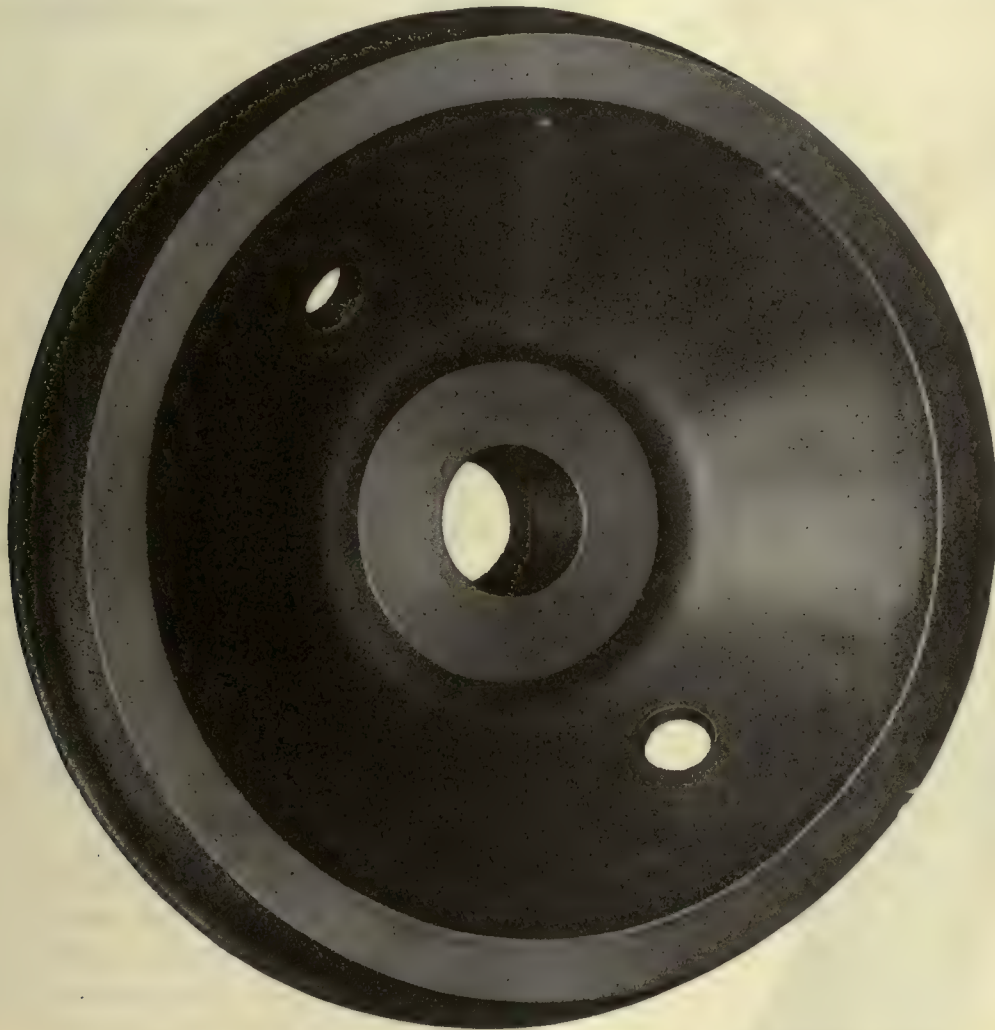
The Chosen Lubricant
of ELECTRIC RAILWAYS



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

Cambria Rolled Steel Wheels and Forged Steel Axles for Electric Railway Service

Other Bethlehem Products for Electric Railways include Armature Shafts, Crossings, Frogs, Switches, Switch Stands, Guard Rails, Rails, Spikes, Splice Bars, Bolts, Tie Plates, Gage Rods, Tie Rods, Gear Blanks, Pole Line Materials, Special Layouts and Trackwork.



BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

District Offices:

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Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

BETHLEHEM



As impregnable as Gibraltar—

Gibraltar, that famous old fortress on the Mediterranean, is equipped to withstand a sustained attack for years—far longer than any ordinary fort.

Boyerized Parts have the same ability to withstand the most determined attacks of their ancient enemies—the “wear-and-tears”. For the Boyerizing process gives them an armor-plate surface that enables them to outwear ordinary case hardened steel three to four times.

Boyerized Parts are the Gibaltars of car equipment. Take your pick from the following list:

Brake Pins	Spring Posts
Brake Hangers	Bolster and Transom
Brake Levers	Chafing Plates
Pedestal Gibs	Bronze Bearings
Brake Fulcrum	McArthur Turnbuckles
Center Bearings	Manganese Brake Heads
Side Bearings	Manganese Truck Parts
Spring Post Bushings	Bushings

The
McArthur
Turnbuckle



Bemis Car Truck Company

Electric Railway Supplies
Springfield, Mass.

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Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.
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Rolled Steel Wheels
Quenched and Tempered
Carbon Steel Axles
Coil and Elliptic Springs

The Pacific Electric car illustrated is one of many others on this property equipped with "STANDARD" Rolled Steel Wheels.

STANDARD STEEL

WORKS COMPANY

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WORKS: BURNHAM, PA.

*Newport News still a satisfied user
of "Tool Steel" gears + pinions!*

1908

**OPS—THE UNSAFE AND NEGLIGENT WAY OF
SUSPENDING FIRE FAILS**

schedule could be maintained even if the maximum speed was cut to 28 m.p.h. The standard ratio is now 17:67. The saving in energy consumption has not been calculated, but there has been a very perceptible decrease in the number of baked armatures and fields. The company has also changed from bolted gears to the Cincinnati Tool Steel Gear & Pinion Company's solid gear.

MAINTENANCE RECORDS

Until the property was taken over in January, 1912, by Allen & Peck, Inc., with J. N. Shannahan as general

*←
"Economical
management"*

The above is an extract from an article in Electric Railway Journal, July 10, 1915, describing features in the "Economical Management and Good Housekeeping" at the Hampton shops of

Newport News and Hampton Railway, Hampton, Va.

*They have tested "Tool Steel" gears and pinions
since August 1908.*

They ought to know.

**THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI, OHIO**

1926



Eighteen years ago they tested their first "Tool Steel" gear installation. By 1925 they had standardized on them. The above advertisement published by us in 1915 told the story then, and is just as suitable today.

This road is but one of many long-satisfied customers—a condition which indicates that "Tool Steel" Gears *do give the service.*

**The Tool Steel Gear & Pinion Company
Cincinnati, Ohio**

The Standard of Quality

TOOL-STEEL QUALITY GEARS AND PINIONS



Some municipalities, as a safety measure, are making heavy trucks and buses prove by actual tests their ability to stop within prescribed limits.

This has been occasioned by the many accidents due to the fact that the weight and speed of trucks and buses throw an *overburden* on the brakes.

The fault is not with the lining, as is more commonly thought, but with the brake drum. Recent investigation has proved that a high carbon drum, irrespective of lining, gives better results than a low carbon drum with the best lining obtainable.

Carnegie Steel Company manufactures brake drum blanks for trucks and buses with carbon content of .45 to .60 by a process insuring full content on the surface of the finished drum. Expensive heat treatment is unnecessary. NOTE: Carnegie Blanks are not furnished in finished form. Some slight machining must be done by the manufacturer.

By insisting on brake drums machined from Carnegie Blanks on your new equipment, you are insisting on the maximum of safety.

CARNEGIE STEEL COMPANY

General Offices • Carnegie Building • 434 Fifth Avenue

PITTSBURGH



PENNSYLVANIA

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED
CANDLER BLDG. NEW YORK

Who Invented the Wheel?

It is generally agreed by students of the history of civilization that that man did more for material progress than any other man could possibly have done. The wheel is the fundamental element in every vehicle of transportation.



A Race of 1830 on the Baltimore & Ohio

COST LESS
PER
TON MILE

THEY CARRY
A SERVICE
GUARANTEE

THE HARD
TREAD
AND
FLANGE
HAS A
MAXIMUM
WEARING
VALUE

CHILLED IRON WHEELS

HAVE KEPT PACE WITH
THE DEVELOPMENT OF
RAILROAD EQUIPMENT

The
Standard
Wheel
for
74
Years

A.R.A. Standards

650 lb. Wheel for 30 Ton Cars
700 lb. Wheel for 40 Ton Cars
750 lb. Wheel for 50 Ton Cars
850 lb. Wheel for 70 Ton Cars

ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS
1847 McCormick Building
CHICAGO

50 Plants—Daily Capacities 20,000 Wheels

THE PHILADELPHIA STAFF
OF THE
MCGRAW-HILL PUBLISHING COMPANY, INC.

*announces the opening
of its new
and larger quarters*

INSURANCE COMPANY OF NORTH AMERICA BUILDING

SIXTEENTH STREET AND PARKWAY
PHILADELPHIA




L. D. WALDRON
General Manager, Eastern District

W. K. BEARD	M. A. WILLIAMSON
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The new telephone numbers are
RITTENHOUSE 3109, 3110 AND 3111

RAILS



NEW RAILS AND ACCESSORIES

A Service Complete from Spike to Rail — with an absolute Guarantee.

Buy All from One Source — with exceptional price advantages.

Many of the Largest Railroads buy regularly from us — with complete satisfaction.

A quotation convinces — "1 ton to 1000"

L.B.FOSTER COMPANY
PITTSBURGH · CHICAGO · NEW-YORK



Cold Dinners for your passengers?

Not if you use

AJAX
BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company

Established 1880

PHILADELPHIA

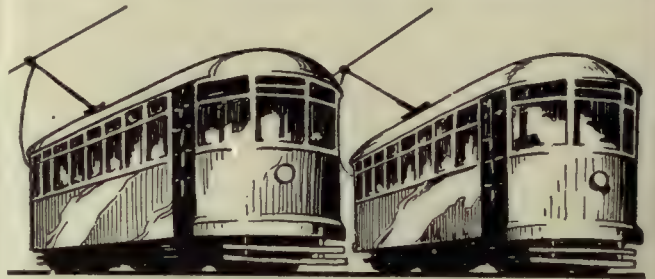
NEW YORK

CHICAGO

BOSTON

CLEVELAND

M-J Armature Babbitt



No less than twenty-five different grades of Babbitt have been successfully perfected in the More-Jones line, designed for various services and at varying prices. "Armature" for electric railways is the recognized standard. *Let us quote you.*

More-Jones Brass & Metal Co.
St. Louis, Mo.

**MORE-JONES
QUALITY PRODUCTS**

DIXON'S ALUMINUM-GRAPHITE PAINT

Prepared primarily to meet the requirements of gas, oil and industrial companies and particularly recommended wherever a light colored paint is desired.

Back of this new product stands our century-old reputation, as well as 65 years' experience in paint manufacturing.

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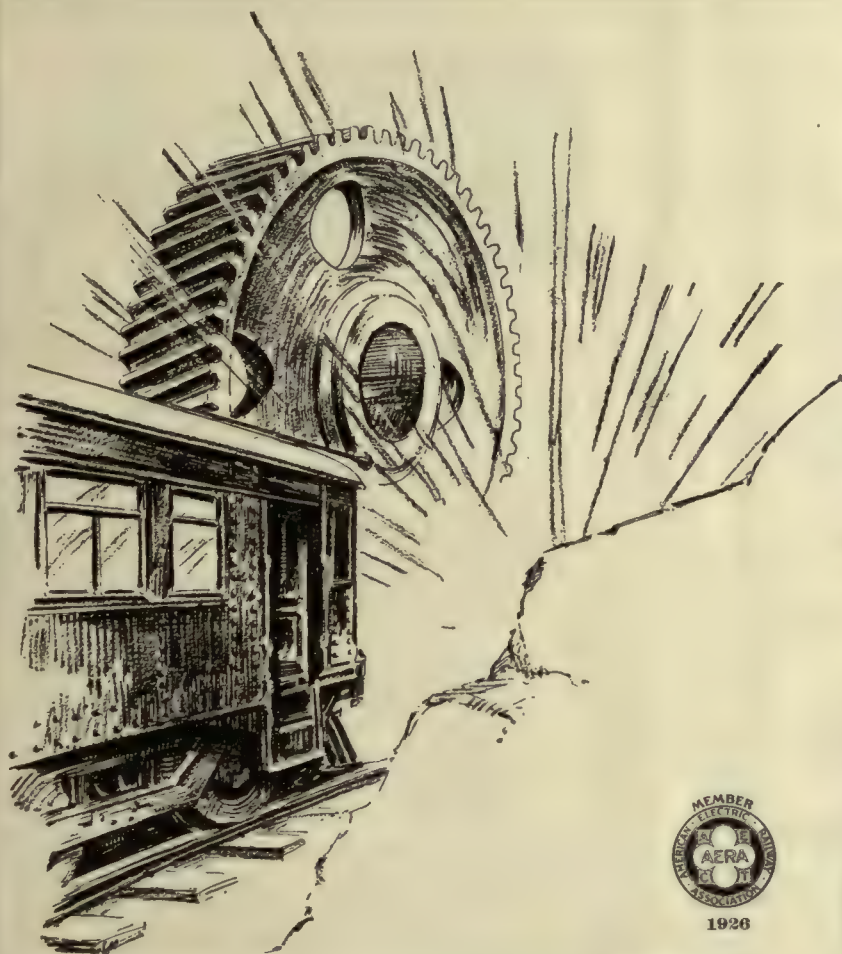
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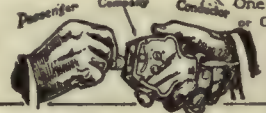
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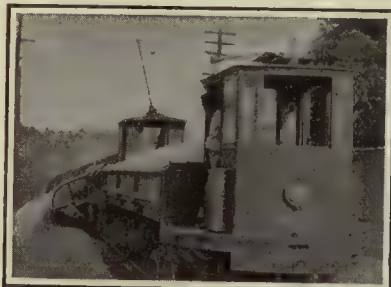
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Westinghouse Air Brake Co.

Air Receivers & Aftercoolers
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Auto Body Co., The
Baker-Raulang Co., The
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Grinders, Portable Electric
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(Continued on page 53)

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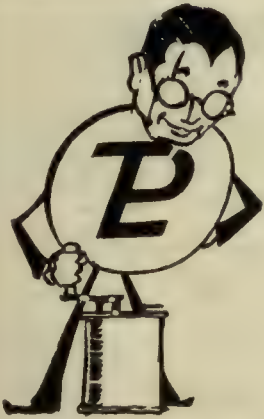
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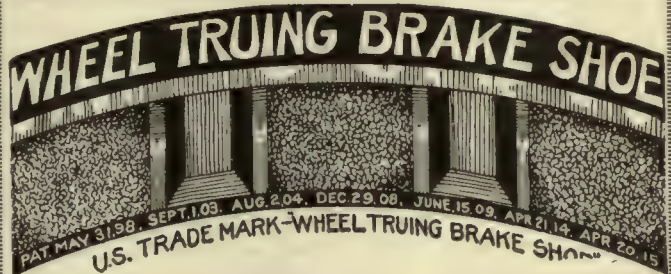
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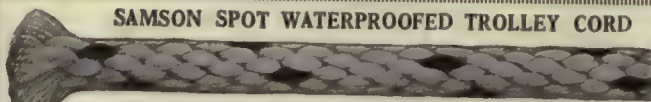
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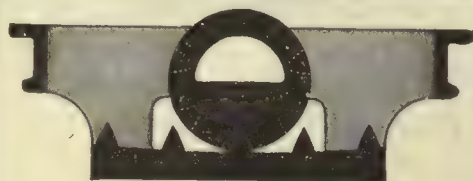
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In order to maintain schedules at a profit the bus must be powered with a motor that can be depended upon always—that stands up under the exacting requirements of modern travel.

Red Seal Continental Motors are the choice of leading bus operators because with them they secure a flexible, easily controlled power, maximum passenger comfort and a dependability which insures against expensive repair delays.



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Offices: Detroit, Mich., U. S. A. Factories: Detroit and Muskegon
The Largest Exclusive Motor Manufacturer in the World

Continental Motors



Thirty "1926" Safety Cars—

Another electric railway, with utmost confidence in its future, has just placed in service 30 new single-truck safety cars equipped in 1926 style and built by the American Car Company.

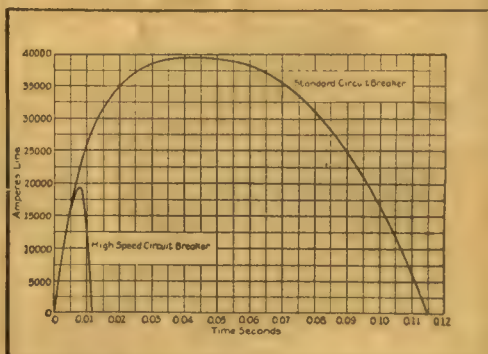
Plush upholstered Brill No.

105-B type non-reversible seats with divided backs, dome lights, control equipment and piping encased, and rubber tile floor covering, are included among the principal innovations. Numerous slogans are painted on the sides of the cars.



Attractively finished and equipped for comfort to stimulate car-riding

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The measure of the added protection

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GENERAL ELECTRIC

ELECTRIC RAILWAY JOURNAL

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WILLIAM T. JACKSON, Director of Public Service for the city of Toledo. Mr. Jackson is well known for his active interest in behalf of city betterment, and he is now serving as President of the Ohio State Conference on City Planning. And as President and General Manager of Joseph Jackson & Son, one of Toledo's oldest and best known firms of general contractors, he has had a very direct part in the upbuilding of the city. He is also first Vice President of the Toledo Chamber of Commerce.

"It effectively protects the pavement"

FOR some time we have been working on the problem of how to prevent rapid deterioration of pavement in track zones—and I believe we now have the solution." This statement was made recently by William T. Jackson, Director of Public Service for the city of Toledo. In Toledo, the city rather than the traction company handles the paving of track areas.

"We use granite block pavement in the track area, but we have found that it is practically impossible to fit the blocks in tightly against the web of the rail. As a result, water and frost enter, and failure of the pavement follows. The flange of the wheel also frequently breaks off the nose of the block, or knocks the block out of place, causing it to pitch toward the rail.

"To overcome this condition, we have installed an asphaltic rail filler each side of the rail. This forms a water-tight bond with both rail and pavement, and

keeps the granite blocks away from the flange of the wheels. We find it effectively protects the pavement and makes a neat looking job. We are, in fact, so well pleased with the result that we plan to follow this practice in our future paving work."

Carey Elastite System of Track Insulation was the material used to effect the improvement in pavement construction described by Mr. Jackson. Traction engineers all over the country today are advocating the use of the Carey system because it effectively protects the pavement and lowers maintenance costs. Noticeable reduction of noise also results where this resilient material is used to cushion the rails.

Write today for full particulars.



CAREY Elastite System of Track Insulation consists of a fibrous asphaltic compound, made in pre-formed slabs to fit any rail. It is easily cut, fitted, and driven into place with a sledge. Unaffected by moisture and temperature changes, and will outlive the track itself.

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TRADE MARK REG. U.S. PATENT OFFICE



SYSTEM OF
TRACK INSULATION



Passenger traffic on the lines of the Altoona and Logan Valley Electric Ry. on which the new cars are used has increased 12% and more, in a large measure due to the improved facilities.



“The People are Pleased with Them”

THAT'S what Mr. S. S. Crane, Vice-President and General Manager of the Altoona and Logan Valley Electric Railway Company wrote about the new cars recently placed in service.

John Doe measures with his own yardstick. “The People” are not always appreciative of the troubles and problems of the transportation company. But they are quick to sense sincere effort to

improve their transportation facilities. Because Mr. Crane has held steadfastly to his policy that “the people be pleased”, more people than ever before are riding the trolleys today in Altoona. Because new, modern, light weight cars please the people, they are developing greater revenue and more cordial public relations.

New, modern cars, to “please the people” are a profitable investment.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries



1926

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The Thirteen modern light weight cars recently placed in service in Altoona are each equipped with four Westinghouse No. 510-A 35 hp. motors, and Westinghouse control. They are operated as one-man cars.

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Vol. 68
No. 2

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Digestible

IN A chemical laboratory a few days ago the editor met a scientist engaged in analyzing food products. He explained how by analysis he could find out every constituent of the food and its exact amount. His purpose was to discover deleterious ingredients in apparently harmless food stuffs.

As he told how government experts are performing invaluable service in this way to guard the public health, it brought to mind a similar work that is done in the editorial office. Vast quantities of copy are sifted—most of it accurate, but occasionally with distorted statements and once in a while untruths.

The presence of such matter renders the printed word just as indigestible as does the presence of improper ingredients in comestibles. False statements are made not so much from an actual desire to mislead, but simply from carelessness. Too many writers fail to take time to investigate for themselves, but accept the word of some one else.

Certainly the reader has no time to investigate and analyze. That has to be done before the story reaches him. ELECTRIC RAILWAY JOURNAL assumes the responsibility gladly in order that its readers may be assured of the accuracy of the information presented in its pages.

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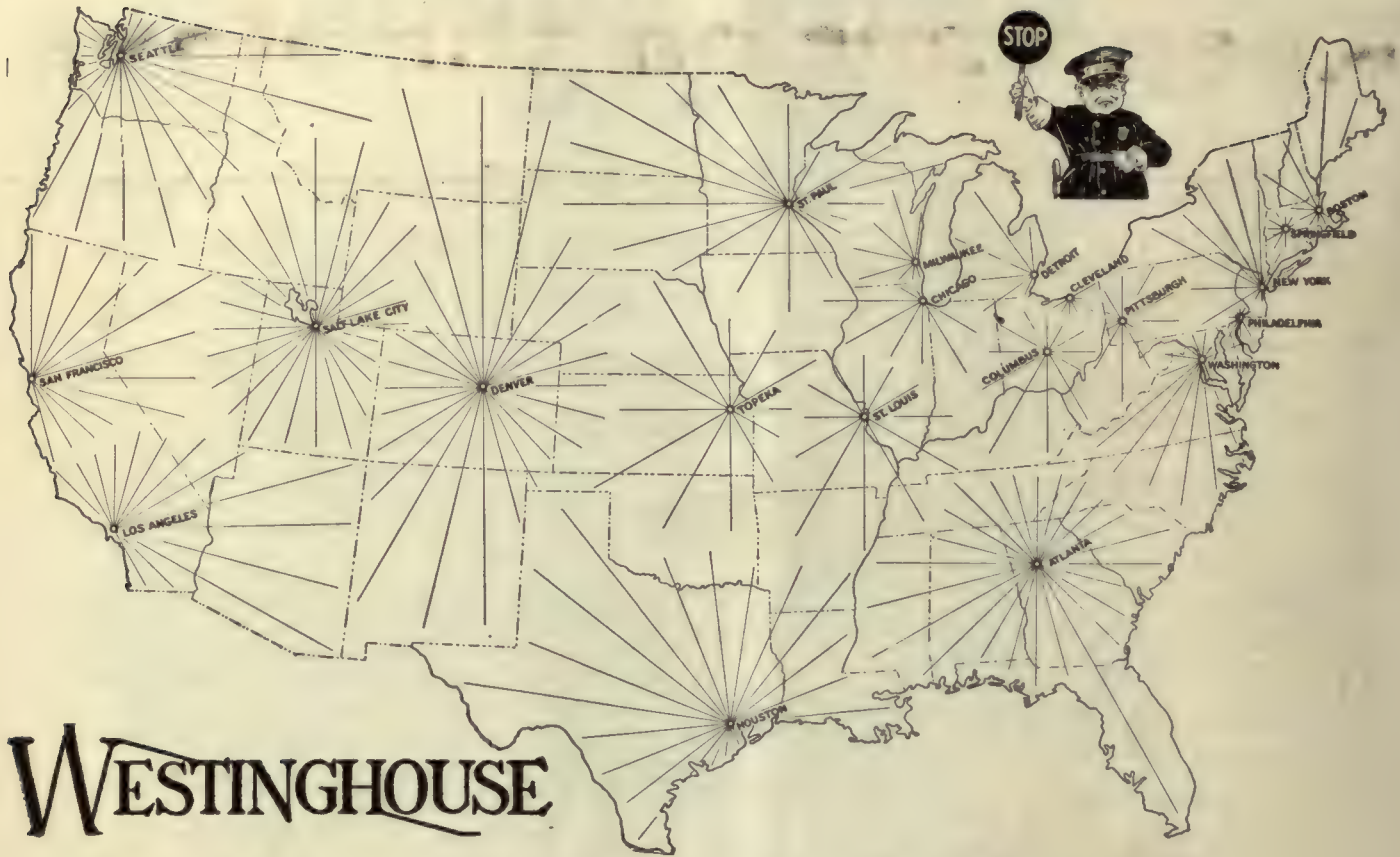


1926

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- and permit the use of metal brake linings, to provide still greater safety and economy.

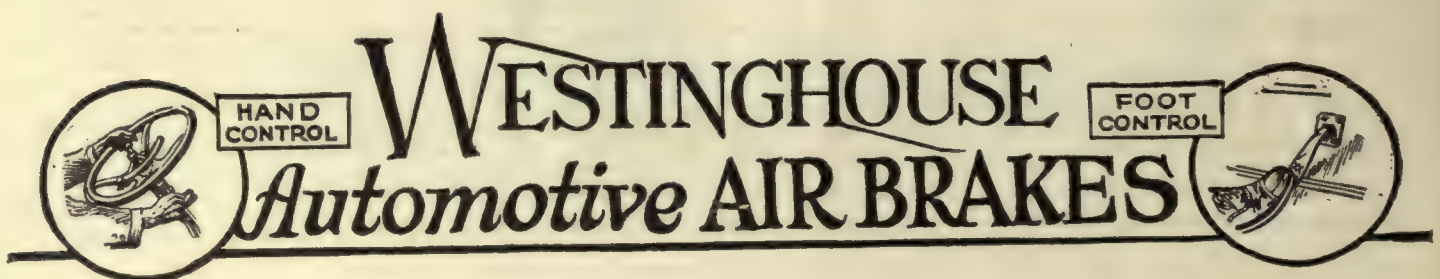
Branch offices of the Westinghouse Air Brake Company—located in the principal cities of the United States—are “service stations” for Westinghouse Automotive Air Brakes.

Here are men especially trained in this branch of our business; men able to demonstrate the advantages of Westinghouse Air Brakes for modern automotive vehicles; men skilled in the application and maintenance of Westinghouse Air Brakes; men available for consultation and assistance to users of Westinghouse Air Brakes.

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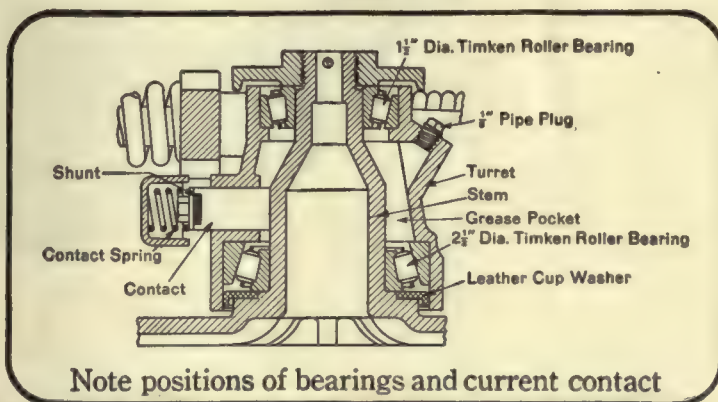
It is such performance at a remarkably low maintenance cost, that makes the O-B Form 4 Trolley Base the logical selection for the modern car. The complete details of design, construction and past performance are interesting. May we send them to you?

Ohio Brass Company, Mansfield, Ohio
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Niagara Falls, Canada

135C



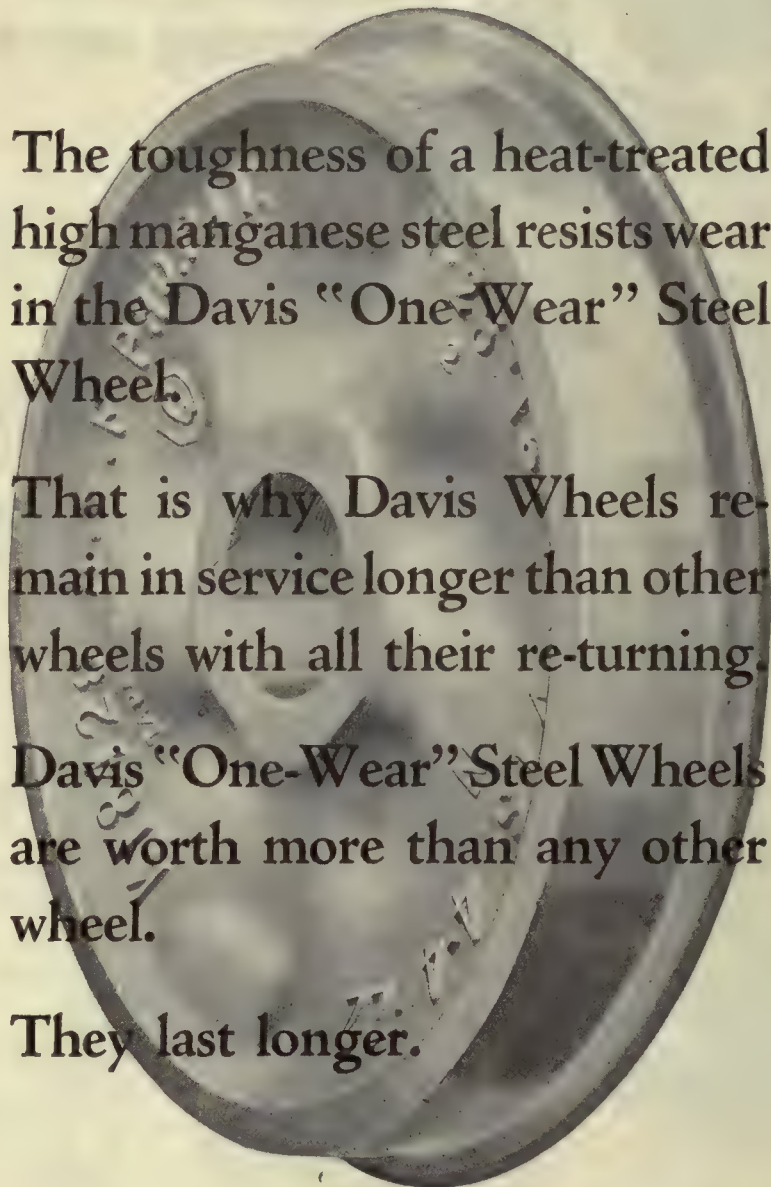
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Catalogue
Quotations
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Estimate, 1925 Detail
Costs

The International Steel Tie Co.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track — Permanent Foundation

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On the new P. R. T. cars for the Sesqui crowds

To aid in handling the extra volume of traffic attracted by the Sesqui-Centennial Exposition, the Philadelphia Rapid Transit Company recently purchased 50 new cars.

Shown at the right are the Keystone Devices—headlights, signs, car signals and registers—that make for efficiency in the operation and maintenance of these cars.



Golden Glow Headlights project a soft yellow beam that easily penetrates rain, fog, dust and darkness. Made for every requirement.

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Hale-Kilburn Seats are designed with this point always in mind. But at the same time they have that durability so essential in reducing maintenance costs. Send for full information.



De Luxe Bus Seat
Type 208

This De Luxe seat has divided back, spring cushions and air cushion pads. Furnished with either leather or imitation leather upholstery.



De Luxe Car Seat
Type 392-EE

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as a private car — except
a luxurious **bus**!*

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LANG BODIES

create new passengers



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CLEVELAND, OHIO

*"After all—
it's the Setting
that counts!"*



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BOTH front and rear doors of cars can be operated by National Pneumatic Treadles.

The door is opened by the weight of a passenger on the treadle. The safety interlock, however, prevents this opening of the doors until the car has come to a dead stop.

When the last passenger is off the step, the door closes and a light flashes before the operator, in front. The same safety interlock prevents the car from starting before the doors are tightly closed and the signal light has flashed.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

Anyone can follow suit-but

Single-motor drive was adopted for the Mack Gas-Electric bus in spite of the universal use of two motors by other American builders. This departure was made for good reasons—engineering reasons, economic reasons—and for distinct operating advantages.

Mack has refused consistently to follow conventions slavishly. Throughout Mack bus construction there are original and exclusive design and manufacturing features adopted because of their demonstrated superiority. *One-motor drive* is just one of these.

The single motor transmits more power than two because of lower electrical and mechanical losses which obviously are the results of simplicity. In addition, weight is conserved, accessibility is enhanced and maintenance considerably reduced.

The acme of accessibility is secured through the central location of the motor, reached for inspection and attention to brushes through trap-doors in the bus aisle. All electrical

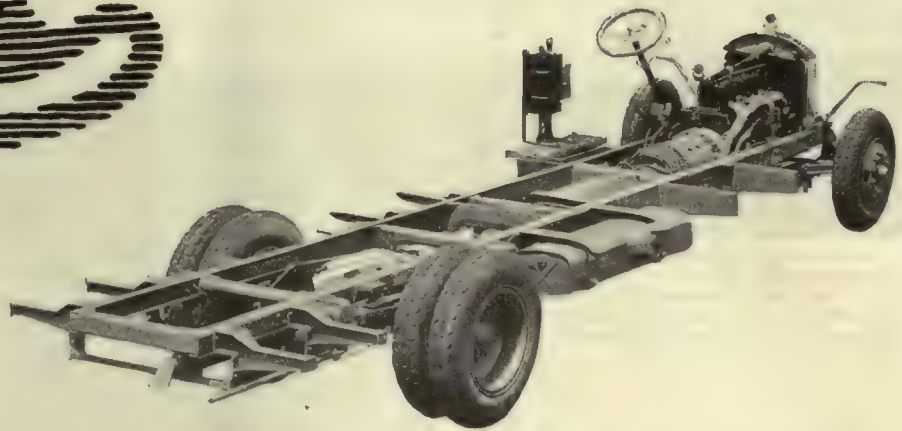


The first bus was a Mack
the first Mack was a bus

Mack-Made Buses

25-Passenger City Type
 29-Passenger City Type
 25-Passenger Parlor Car
 25-Passenger Suburban Type
 29-Passenger Suburban Type
 25-Passenger Gas-Electric
 29-Passenger Gas-Electric

—one-motor drive



Mack again stepped forward

units are removable from below without disturbing adjacent assemblies.

Shock-Insulation in the Mack Gas-Electric does not mean protection from electrical shock; it means protection from mechanical shock—road impacts, twisting strains and vibration to which all motor vehicles are subject. Every moving part is insulated from the frame by blocks of live rubber—Mack Shock Insulators. Three of them support the engine, two support the rear end of the generator (its front end is supported by the engine bell-housing), three more support the motor and eight others on the spring-ends take care of the axles. In addition, the Mack Rubber Torque Insulator cushions the drive from the engine to the generator, damping out the annoying and destructive torque vibration set up between the engine and the generator armature.—Just a few of the exclusive superiorities of the Mack.

The Mack direct factory branch nearest you will be glad to give further particulars and introduce you to the superior riding and control qualities of this newest member of the Mack family.

MACK TRUCKS, INC.
 INTERNATIONAL MOTOR COMPANY
 25 Broadway, New York City

One hundred and seven direct MACK factory branches operate under the titles of: "MACK INTERNATIONAL MOTOR TRUCK CORPORATION," "MACK MOTOR TRUCK COMPANY," or "MACK TRUCKS OF CANADA, LTD."

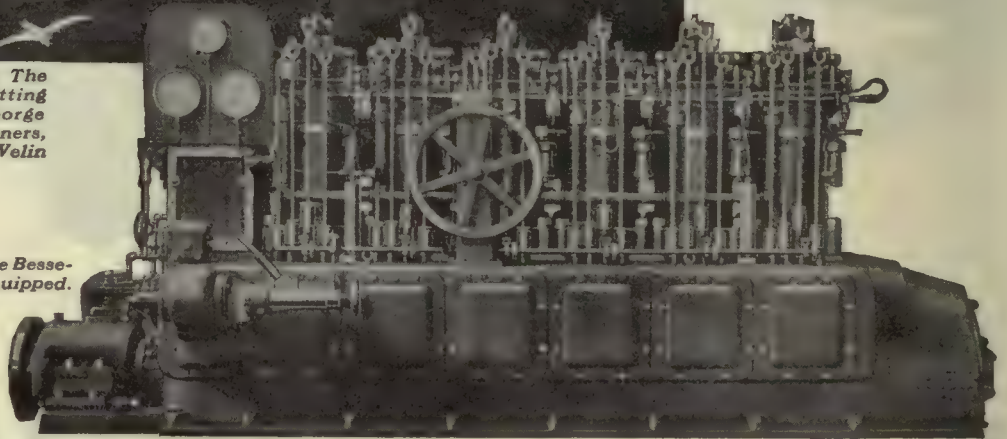


Now—Diesel Engines with Timken Bearings



Timken Bearings were used by The Bessemer Gas Engine Co. in fitting the "Alpha." Owner, Mr. George Marshall Allen, New York. Designers, Henry J. Gielow, Inc. Builders, Welin Davit & Boat Corporation.

A 125-150 h. p. direct reversible Bessemer Diesel Engine, Timken-equipped.



No responsibility is too great for Timken Tapered Roller Bearings. Latest proof is the use of Timkens in Diesel engines, by The Bessemer Gas Engine Co., one of the great producers of internal combustion engines.

Only the most exhaustive comparative experiments by Bessemer certified Timkens for numerous Diesel mountings, including the marine propeller thrust position of a costly private yacht.

Speeding this 100-ft. vessel, of 250 h. p., at 12 knots or more, the Timken Bearings must and do perform infallibly. With their easy-rolling properties, tapered design, Timken-made steel, and *POSITIVELY ALIGNED ROLLS* Timkens bring power economy, smoothness, freedom from attention, and permanent precision.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN

Tapered

ROLLER BEARINGS



Lower Running Expense? Ans.: Modern Cars!

The question of operating expense is always a timely one for consideration. The answer lies in equipment that requires less power, less labor, and less maintenance. In other words, you can lower expenses by equipping your lines with modern cars.

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Successor to McGuire Cummings Mfg. Co.

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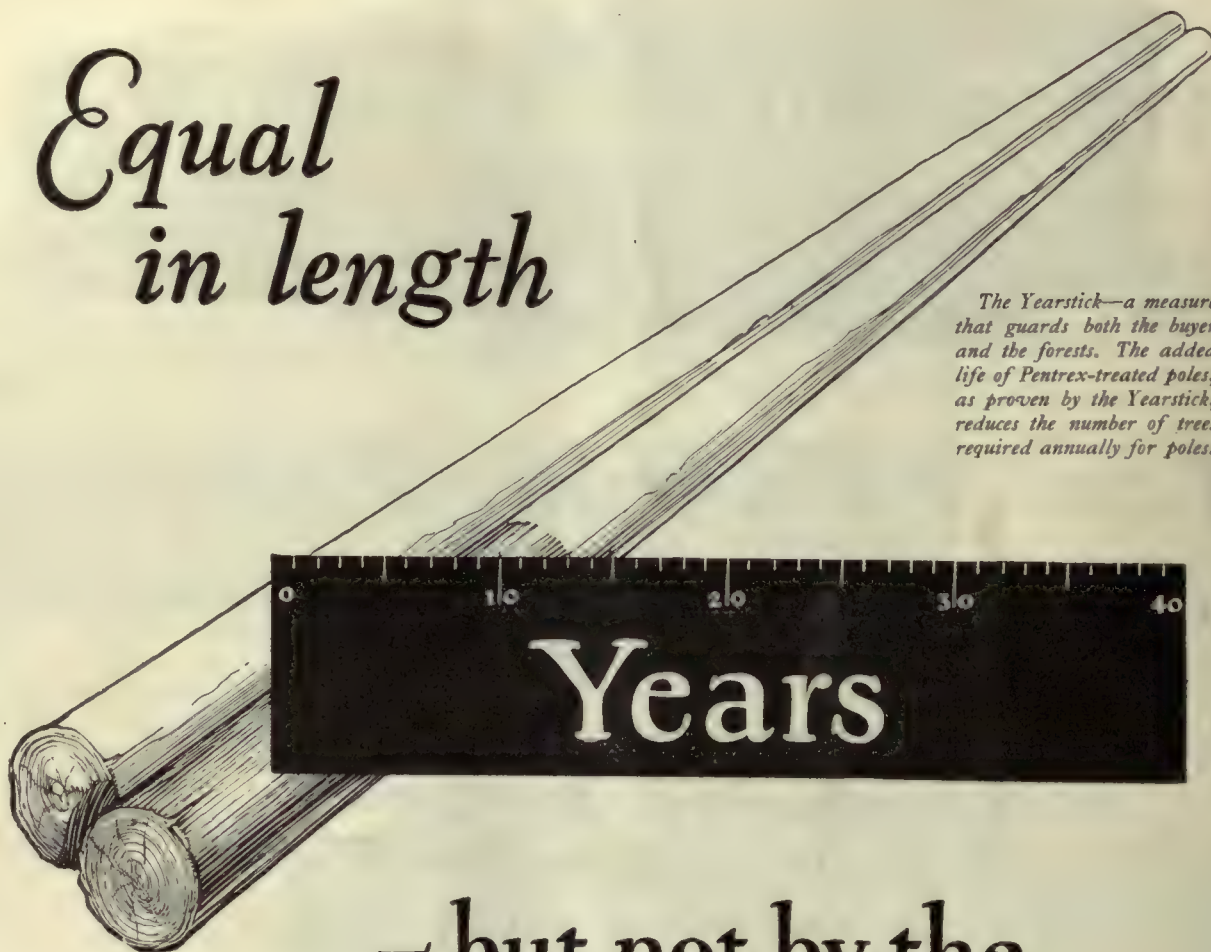
Light Weight City and
Interurban Cars

Single and Double Trucks

and—the Cummings Gas-Electric Motor Coach

*Equal
in length*

The Yearstick—a measure that guards both the buyer and the forests. The added life of Pentrex-treated poles, as proven by the Yearstick, reduces the number of trees required annually for poles.



— but not by the
Yearstick

TWO POLES. The yardstick declares them the same length. But that magic measure, the Yearstick, shows one far longer than the other—in years of service.

That pole has been Pentrex-treated. As the preservative was forced into the wood, years of added service entered the pole—but only the Yearstick can detect their presence. Measure the poles you buy with the Yearstick as well as with the yardstick.

And Graybar Electric can supply you with poles that check with both.

The Graybar quality tag—under which 60,000 electrical supplies are shipped.



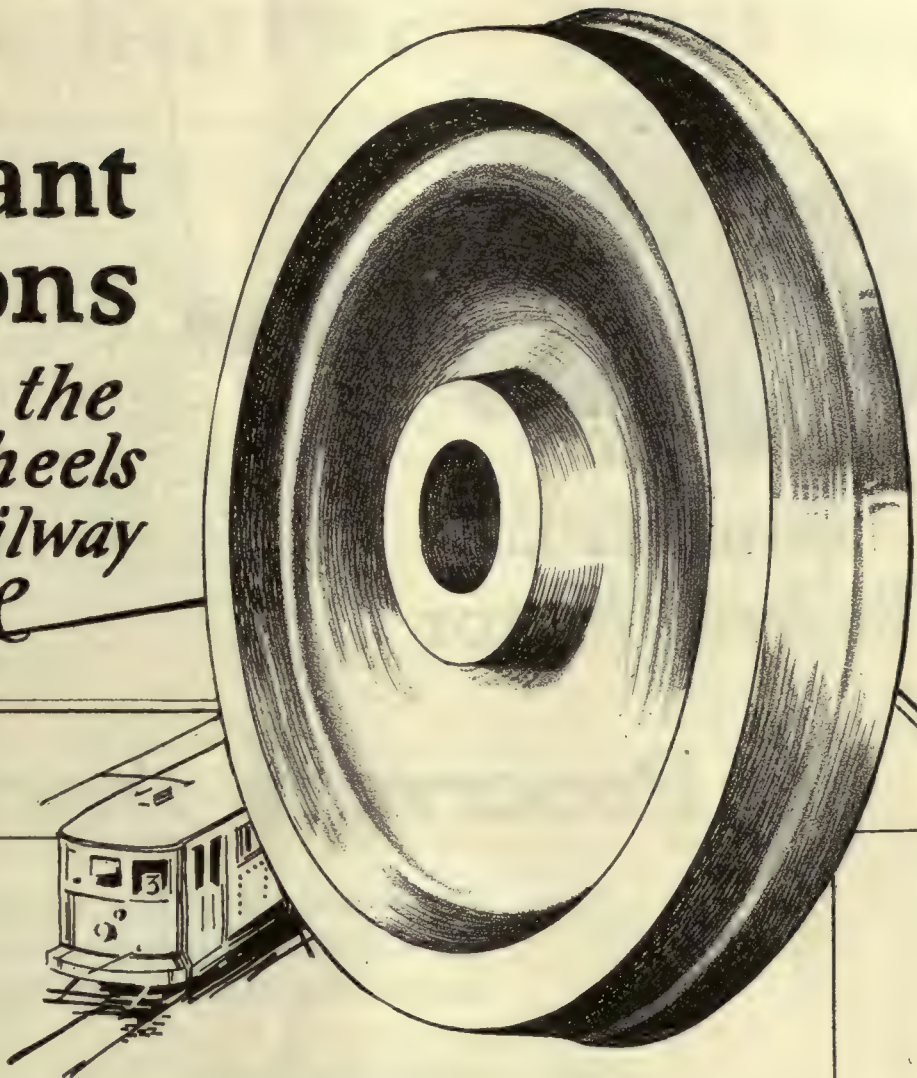
GraybaR

ELECTRICAL SUPPLIES

Successor to *Western Electric* Supply Dept.

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3 Important Questions *that govern the value of wheels in Electric Railway Service*



Volumes might be written on the design, construction and other features of wheels, but their true value will always be governed by the manner in which they answer three important questions:

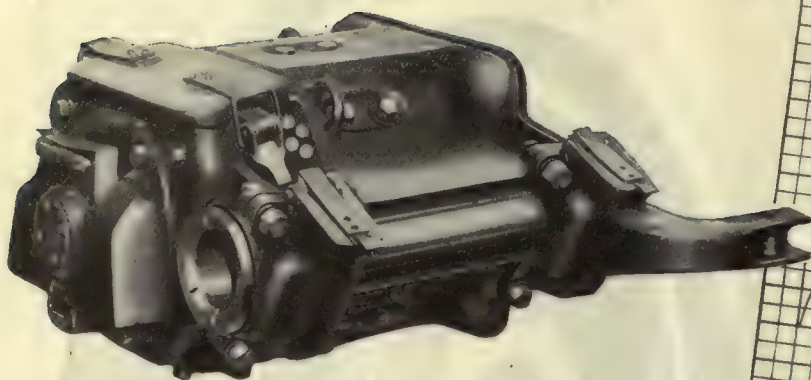
1. Are they *safe*?
2. Are they *dependable*?
3. Are they *economical* in mileage cost?

Gary Wheels offer the utmost in *safety* because of their **one-piece wrought steel** construction; they offer as evidence of their *dependability* the fact that they operate for years without repairs or replacements of any kind....and as for *economical mileage cost*, they refer you to the proper department of any of the many railroads that have kept records concerning them. Our wheel specialists are at your command.

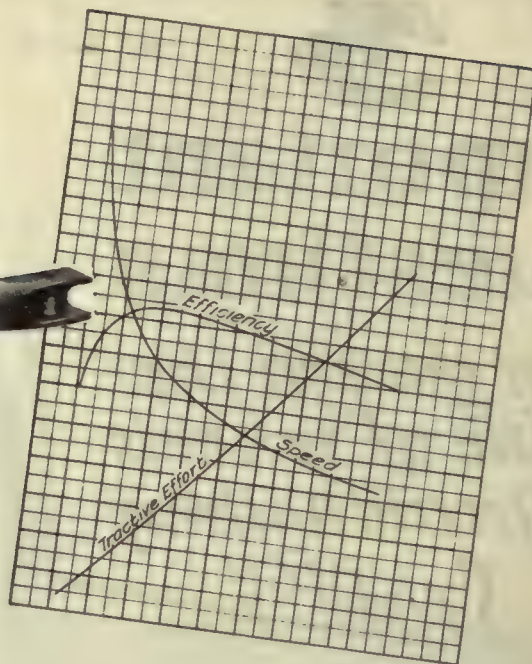
Illinois Steel Company

General Offices, 208 S. La Salle Street

Chicago, Illinois



Your G-E Railway Motor



Preserve its characteristics

To obtain the best commutation, the brushes for a railway motor should be selected with full knowledge of the motor characteristics.

Only the General Electric Company possesses complete design data pertaining to your G-E Motors. The brushes recommended for them by G-E motor experts will insure the best service—and at lowest cost.

Preserve the characteristics of your G-E Motors and you guarantee continued successful operation. To do this, G-E Brushes, of *original equipment quality*, are essential.



What is true regarding the importance of proper brush selection in preserving the characteristics of your G-E Motors applies with equal emphasis to the purchase of all motor parts. The only safe procedure is to specify G-E Renewal Parts for G-E Motors.



For
Original Equipment Quality

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 68

New York, Saturday, July 10, 1926

Number 2

The Surprising Feature of the Cleveland Shopping Survey

ELECTRIC railway men are so familiar with the principal causes and effects of street congestion that they do not realize how ignorant the general public is on these matters. Take, for instance, the effect of parked vehicles on a downtown street. It is obvious to the railway manager that a line of standing automobiles along the curb or along both curbs of the street cuts down its useful width by just that amount, consequently general parking hampers the movement of all traffic. He does not appreciate that the downtown merchant often looks upon the rows of parked automobiles as representing large numbers of customers who are making purchases within the district.

Nothing will help more to clear up this situation than a series of surveys such as that recently completed in Cleveland. The purpose of the Cleveland survey was to learn the methods of transit to the downtown stores in the city used by customers on several days. Similar surveys have been made in other cities, but for the most part they have been fragmentary in character. The Cleveland survey stands out prominently in three ways: It was quite comprehensive as it included most of the leading downtown stores in the city. It was conducted by the merchants themselves, and it is of recent date. The result found, that an average of only one person in five who visited the stores on the three days of the test came in a private automobile, is not a surprise to most men familiar with the situation, but proved to be very much of a revelation to the merchants of Cleveland. It is probable that remedial action, with the approval of the retail business interests, will follow the results of the test.

The really surprising information developed by the survey in Cleveland, however, is not the proportion of customers reaching downtown retail stores by electric car and auto. It is that this rather simple method of establishing a most important fact has not been utilized to a greater extent in settling similar questions in other cities. There have, of course, been other surveys of a like nature, but there have been very few of them and nowhere near as many as the number of cities where the question of parking in the downtown streets has been and is very active.

The Cleveland example also points to a way of making the survey both comprehensive and very convincing. This is by letting the merchants make the count with their own forces, though in Cleveland the railway helped to organize the plan and largely bore the expense. There is no more certain way of establishing any truth in the mind of a person than that of letting him reach it by his own deductions or action. This is the basis of the laboratory method of teaching physics and chemistry. It should work equally well with a downtown retail merchant. Such a man under the false impres-

sion that most of his customers reach his store in their private automobiles usually will not be convinced of his error by statistics from other cities. Even figures from a neighboring store may not be convincing. The merchant may think that his own clientele is more exclusive and belongs largely to the limousine-owning class. But let him make his own tabulation at his own store door by his own employees and he no longer can be blind to the truth.

There is a corollary to the problem just demonstrated, which should also not be forgotten by the downtown merchant. This is that if custom is impeded in its flow to his store it will go to those which are reached more easily. In other words, if street car passengers, who make up the bulk of the customers, find that it takes too long to get downtown to shop they will patronize their neighborhood shops. This would, of course, mean a loss to both downtown merchant and trolley company. In this their interests are identical. Hence it should not be difficult for them to get together.

For the benefit of the industry there should be many polls of shoppers like that in Cleveland.

No Other Course Was Open to the Interborough

NO CAUSE for quarrel can be found with the position taken by the management of the Interborough Rapid Transit Company, New York, in the controversy with its motormen and switchmen who have gone on strike. These men elected to secede from the Brotherhood of Interborough Employees, with which body the company had just arranged a renewal of the existing working contract. This was, perhaps, their privilege, but it was also their obligation to accept the consequences of that action. On its part the company was not hasty. The remarks of Mr. Hedley referred to in this issue make plain the position of the company. The grounds for his action, backed by the brotherhood as a whole, were that for him to consent to arbitrate any matter with any group that had left the brotherhood would be a breach of faith. So the merits of the issue hinged on that ethical point. The company did feel, however, that the wage demands were exorbitant, and one of its spokesmen expressed the opinion that an impartial board would find that the wages now paid were adequate. There seems no reason not to accept this as true.

The good offices of the Transit Commission were sought as mediator but without avail. It is to the credit of that body that it lost no time in idle palaver when the issues at stake were made plain and that it arranged to secure the co-operation of the other transit carriers to assist in the emergency by increasing their facilities. The concern of that body, apart from attempting to secure an amicable adjustment, is to see that the public

suffers a minimum of discomfort. This it did with unusual results.

Perhaps the best answer to the charge of the inadequacy of the present rates of pay for the motormen and switchmen is found in readiness of other men to accept the wage scale that the men who went out purport to regard as inadequate. Defections from the ranks of the strikers further attest the adequacy of these rates and indicate that a very large number of the men who went out were carried away by emotions which in their more sober moments they were able to analyze impartially. Last-minute news indicated that the strikers would seek affiliation with the American Federation of Labor. That in itself was significant of the feeling of isolation that had taken hold of the strike leaders, an isolation best expressed in the words of one of the leaders late on July 8 that the "strike is still on." A strike that is still on and is effective is its own best spokesman. Some of the New York papers that cater to the sensational went to great lengths to capitalize the strike, but the public was apathetic. It understood the issues too well to permit itself to become demonstrative—except in so far as its attitude reflected impatience at the inconvenience which the ill-advised action of the men on strike had caused them to experience.

Tax Reductions Offer a Saving Without Investment

IN THIS issue is found an abstract of Economist Vickers' theories on taxation as given before the Central Electric Railway Association. They are not new, but his application of such ideas to the railway industry are. He holds forth hope that concerted action will bring relief, but insists that railway managers must first understand these principles. Here is an opportunity for a nationwide policy and a nationwide action. For years public service properties have paid taxes on the physical value of the property owned or used in public service. Other properties owned by our political subdivisions do not pay taxes because it would be taking the money out of one pocket and putting it into the other. While the ownership of our utilities is generally in private hands the conduct of their corporate existence is under public control in one way or another.

The natural conclusion might be that the utilities should not pay taxes at all. But not so in the theory of which Captain Vickers is a proponent. The ability to pay is the only correct basis to use, he says. This is analyzed still further into a combination of gross and net revenue basis with suggested values worked out for several cases.

The opposite view of boosting the rates to pay the tax has proved impracticable. There is an economic balance that limits this scheme, as many operators know. The cost of mass transportation must be kept down as low as may be to maintain the volume—and without volume a property is in a bad way.

It is one thing to work out a theory and another to carry it forward. Captain Vickers has done that too in several instances. With his abundance of detailed information and his ability to put it across before managers or tax commissions, he can be of material assistance in specific cases.

Here is an opportunity to save several per cent of gross without the investment of a dollar of new money.

Infraction of Traffic Regulations Is a Growing Evil

OPINIONS may differ as to whether or not traffic regulations in the average city are well adapted to present congested conditions. There can be no doubt, however, that infractions of these regulations are becoming more and more frequent. Like most bad habits, this disregard of the law grows upon those who practice it.

Passing another vehicle on the wrong side is thought by many drivers to be a creditable achievement if one gets away with it. Beating the traffic officer's whistle at a street intersection gives the average automobilist a glow of inward satisfaction. Parking in a restricted area is considered quite a feat if one does not "get a ticket." So it goes. Violation of traffic regulations seems almost like a game, the winner being the driver who disregards them the greatest number of times in a given period.

Nobody stops to analyze the results to himself of this general habit of violating the traffic regulations. For once that the automobilist gains some slight advantage through his own transgression, he suffers delay a dozen times on account of the transgressions of others. Consider, for example, the man who goes over to the wrong side of a two-lane roadway in order to pass the vehicle ahead of him. Where traffic is dense he seldom succeeds in this attempt, but usually loses in his own place in the column and effectually blocks movement in the opposite direction. Yet nearly everybody does this when opportunity offers.

Even more serious is the effect of this attitude on public transportation vehicles. Instances can be seen every day where one man in a private automobile blocks a street car or bus carrying 20 to 100 people. Perhaps the man who never uses public transportation vehicles can afford to be indifferent about blocking traffic. But how few people there are who come in this category. While a great many people own automobiles, the number who use them habitually when traveling on congested city streets is comparatively small. Traffic counts have shown time after time that upward of 75 per cent of the traffic is being carried by public conveyances. The man who selfishly delays them today is likely tomorrow to be a passenger indignant at a similar action of some one else. This is a point which can well be emphasized by the transportation companies in their publicity work.

Detroit's Mayor Is Right About the Jitneys

MAYOR SMITH of Detroit has taken a strong stand on the jitney in Detroit. That is as it should be. Despite this the issue has been complicated by further court action. Offhand it would seem that there could be only one answer to the question—the answer Mayor Smith has stated most emphatically. He wants the present jitney ordinance strengthened and the jitneys thrown off the streets altogether. It is an answer so preponderant in the weight of the evidence behind it that it appears queer the issue should arise at this time. How the question did arise anew is best told in the article elsewhere in this issue.

The plea does seem a little ingenuous that was made by the spokesman for the jitney drivers, to the effect that the move was unwise from a civic standpoint

arbitrarily to order \$500,000 worth of rolling stock off the streets when transportation facilities are none too plentiful." Opposed to this, of course, is the statement of H. U. Wallace, manager of the municipal railway, about the arrangements he has made for taking over the jitney traffic. But the action of the city was not hasty. The case has long been in the courts and the jitney men had fair warning. For the present the jitneys are still running under a temporary restraining order. It is another respite they have achieved—nothing more. In the end the Mayor's idea of entire elimination of the jitney will prevail. Particularly in the case of a municipal railway is his argument irrefutable that if the railway is to give the best possible service at the lowest possible fare it should have a monopoly. In no other way can that end be secured. The strange thing is that at this late day it should be necessary to reiterate this self-evident fact. As the Mayor has so aptly pointed out, Detroit, if it needs to do anything, needs to strengthen its anti-jitney ordinance.

Ways Exist for Saving

Some of the Little Interurbans

LAST year witnessed the dropping out of service over a number of miles of lightly traveled interurban track. This spring has seen some more of the investment in the smaller interurbans wiped out. Does this mean that the small interurban roads have had their day? A few instances like this can hardly be as significant as the failure of the Union Bus Terminal at Indianapolis, and no one will say that the day of the motor bus is at an end because its use was not applied wisely in some instances.

Too many of these unfortunate interurban lines were built with the hope of creating an abnormal riding demand in a community too limited in population and possibilities really to need them. Some of these smaller routes have been kept in operation by means of common financing along with more successful trolley lines. Perhaps for a time they paid their way, for the novelty of the new means of transportation may have brought on a period of overstimulation, but in such a case the let-down was all the harder.

If these little fellows are not all doomed, what can save them? That depends somewhat on the individual road and on the community it serves. The possibilities of passenger service in a purely agricultural community are rather meager, yet a route may be so situated that it can give a superior type of freight service. In urban communities the prosperity of these lines depends almost entirely on the prosperity of the various industries in the cities served.

If there was a time in these unsettled years when an interurban management could calmly map out plans for the future it is now. Wages and material prices have approached some semblance of stability, many of the misunderstandings under commission regulation have been cleared up, and the limitations of bus competition have been pretty well demonstrated. In addition there are examples of what many successful managements have been able to do by extensive modernization of equipment, roadbed and terminals. So there is precedent for and a record of what to expect from almost anything the management may want to try.

These small interurban lines need not die off. If there was something more than a mere gamble that set them going in the first place, it must still be there if the right means are used to give it new life.

Constructive Thinking Just as Prevalent as Ever

"THERE'S nothing new under the sun," sang the bard. Perhaps he dealt with things spiritual rather than material, but even on this ground there may be found those who would be disposed to question his words. In the field of invention, for example, we find that genius still manifests itself in new and varied garb. Years ago we were told that all was up with the inventing business; that everything worth developing had been trotted out and placed on exhibition and that naught was left for the erstwhile man of ideas save to spend his declining years in saddened retrospection. But the proponents of this fallacious reasoning have been confounded. Today more worth-while ideas are born per minute than ever before.

It would not seem reasonable to suppose that the electric railway industry has escaped this well-spring of constructive thinking. There have been and are many forward-looking men who have gazed on the business of transporting their fellows and found it good. From these sources have come the inspirations for the Grand Rapids cars, the Philadelphia plan for co-ordinating every conceivable form of public transportation, the C.E.R.A. standardized freight cars, the Pittsburgh plan for rewarding employees who submit valuable suggestions—in short, all of the progressive movements which have tended to give the lie to the dirge that the industry is dying by inches. But there is ample room in the choir loft for many more singers with persuasive voices. And there is also a need for a more keenly attuned ear on the part of many railway managements, for often the finest singer renders his *magnum opus* in pianissimo.

Ideas are to be had for the taking. There should be no wilderness requiring the strident shouts of a prophet. In a field of activity which has lagged behind, for whatever reason, there is no room for petty bickering, for small thinking, and especially for executive deadwood. Invention is dead—Long live Invention!

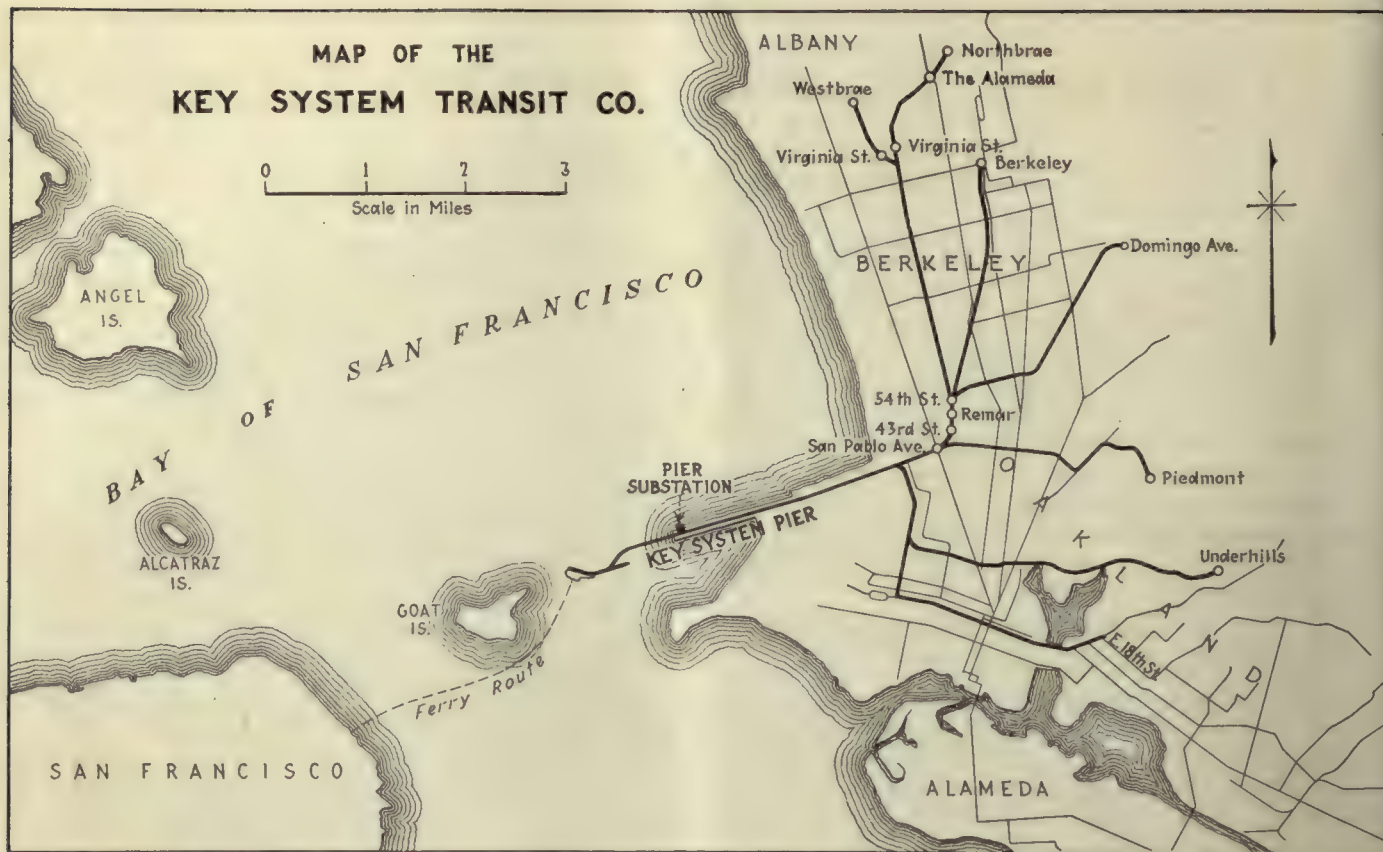
Cleveland Convention

Bids Fair to Exceed All Others

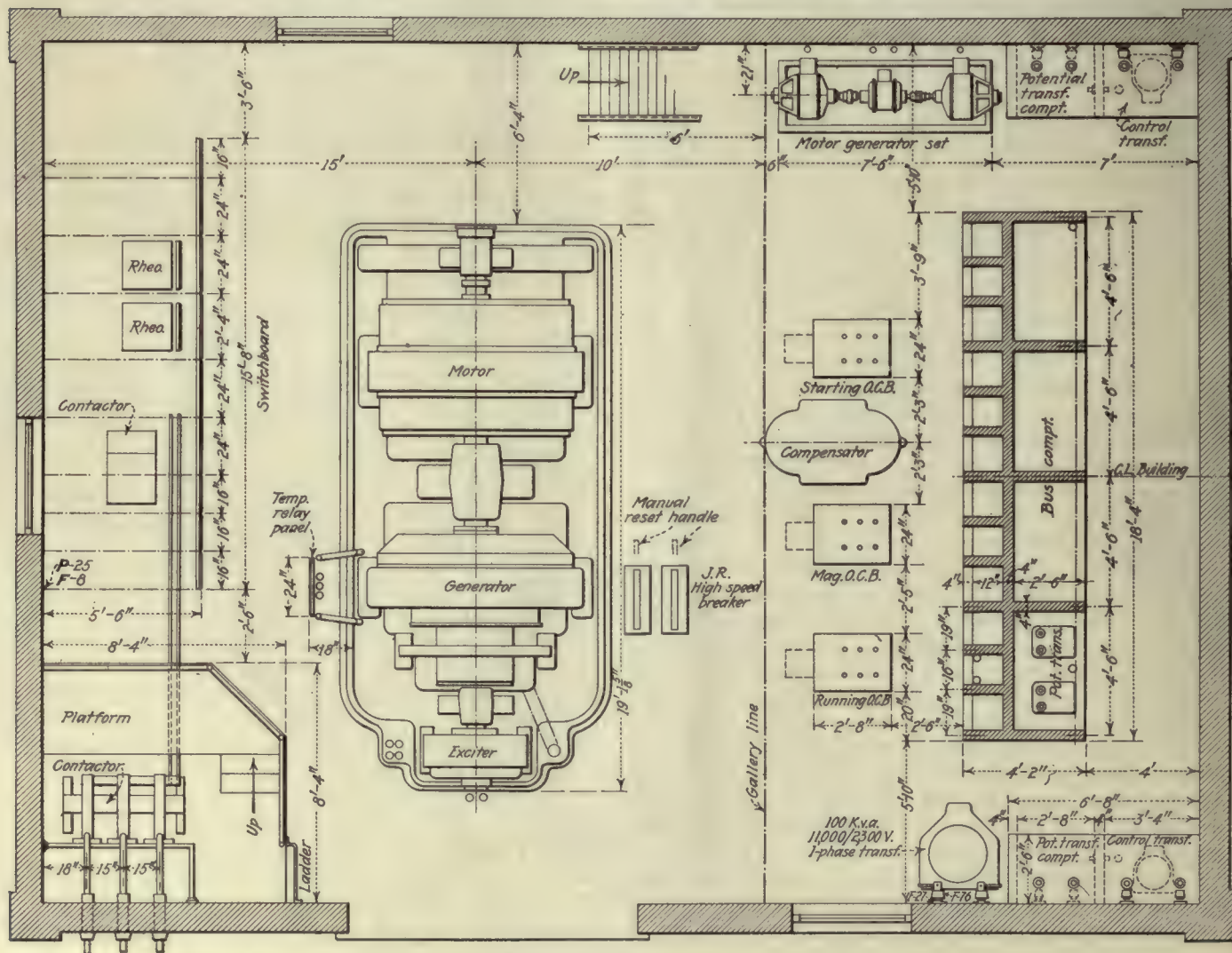
EXPECTATIONS that the Cleveland convention, to be held next October, will be the largest ever held by the American Electric Railway Association now appear to be more than justified. At the meeting of the exhibit committee held in Cleveland this week it was found necessary to revise the arrangement of the exhibit space to care for the requests already made. This action was taken even though the original plan for the convention called for a considerable increase in space over that sold at Atlantic City last year.

Plans for the technical program have not yet been announced in full, but it is to be assumed that the papers and addresses will be fully in keeping with the rest of the arrangements. The improved outlook in the industry and the many problems that merit discussion will prompt many to do their part toward making this convention the greatest in the industry annals.

It should be unnecessary to urge attendance at a convention such as this. Geographically, the location should attract many who have not been present at meetings in recent years. Instead of bringing up arguments why one should go to the convention, this year it is going to be the reverse—and it will be difficult to find reasons why one should not go to Cleveland.



Outline Map of the Key System Transit Company Showing the Location of the New Pier Substation



Ground Plan of the Pier Substation Recently Put in Operation by the Key System Transit Company

Key System Transit Company Completes 1,500-Kw. Substation

Motor-Generator Used with Automatic Control Equipment that Allows 300 per Cent Overload Until Windings Reach a Predetermined Heat, at Which Point Load Is Automatically Relieved to Prevent Overheating — Set Can Also Be Controlled from Remote Point

By H. P. Bell

Chief Engineer Key System Transit Company, Oakland, Cal.



Where the Key System Transfers Its Passengers to the San Francisco Ferries, 3 Miles Out in San Francisco Bay

The Oakland and Berkeley hills can be seen in the background. The new 1,500-kw. substation constructed to handle this important traffic can be seen halfway inland toward the shore. It is located about at the point where the wooden trestle joins the causeway

RECENTLY an interesting application of automatic substation equipment has been completed by the Key System Transit Company of Oakland, Cal. This system is part of the company's trans-bay service between San Francisco on the peninsular side of San Francisco Bay and the nine different cities which are served on the continental side of that body of water. This trans-bay service consists of a combination ferry boat-interurban train service in which passengers starting from San Francisco ride a distance of 2.9 miles by ferry boat and then transfer at the Pier Terminal to one of a number of trains bound for diverse destinations in the continental or East Bay territory, as shown on the accompanying diagrammatic route map. The Pier Terminal is located at the extreme westerly end of a pier which extends approximately 3 miles into the bay from the continental shore line. This pier is composed of about 2 miles of solid earth fill and 1 mile of trestle structure.

Trains consisting of from one to eleven cars leave the Pier Terminal and follow one another on a 50-second headway. Upon reaching the mainland the lines fan

out to their respective destinations. At the same time that each set of trains is leaving the Pier Terminal with passengers from San Francisco another set is arriving with passengers who transfer from the trains to the ferries bound for San Francisco. In this manner 638 trains per day and 20,000,000 passengers per year are handled through this throat of the system. It was to meet the exacting demands for proper power service to this most important part of the system that the new substation was installed.

This application called for a most reliable installation which would operate successfully on large overloads for short periods, and when overloaded to the safe temperature limits of the equipment, would "back off" from the load but still hold operating voltage on the line until a sufficient time interval had elapsed to reduce its temperature, and then again take up its overload, if necessary. Thus a motor-generator set, with shunt-wound generator, with special control and other features described later, was selected to meet the requirements of this particular application. The installation as now completed will be able to handle the future



A Four-Car Train of the Key System Transit Company Passing the New Substation Located at the End of the Earth-Filled Portion of the Key System Pier Well Out into the Middle of San Francisco Bay

development of this portion of the system by the addition of forced ventilation when required.

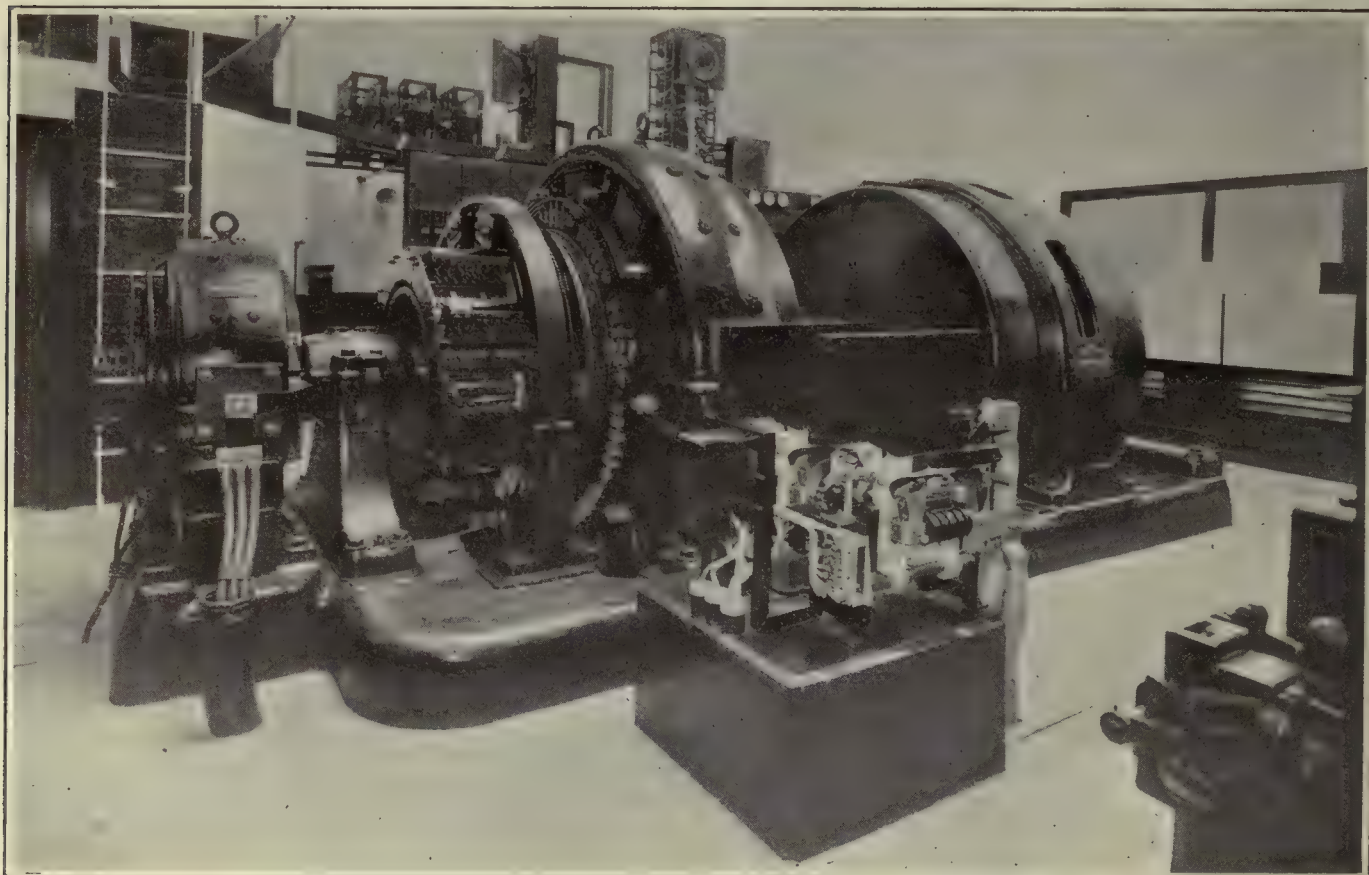
Addition of this station permitted the removal of \$11,000 worth of copper feeder cable and decreased the feeder losses in this section from 22 per cent to 9.6 per cent. The operating voltage was also increased, which allowed a higher speed of operation of the trains, thus increasing the track capacity in this congested territory by 11 per cent. The station was placed in operation early this year, and the time has been too short on which to base performance data. Its operation, however, has been thoroughly satisfactory and capable of meeting the estimated requirements.

The new substation is located at the westerly end of the earth fill portion of the pier, approximately 2 miles from the shore of the mainland. The building is practically surrounded by salt water, with its floor line 7.7

ft. above high-tide water level. Great care was necessary in the construction and installation to combat and overcome the effect of salt water and salt air. Proper consideration was given for earthquake hazard in the construction and support of the building. The structure, as shown in one of the illustrations, is of reinforced concrete, built on concrete piles, which were driven practically to the point of refusal into the underlying hardpan.

The ventilation is supplied through three series of louvers, one just above the floor level, one just below the coping, and one in the monitor roof. These furnish an abundance of fresh air with good circulation. Provision is made for future addition of forced ventilation as found necessary to delay the action of the temperature overload control.

The equipment, furnished by the General Electric



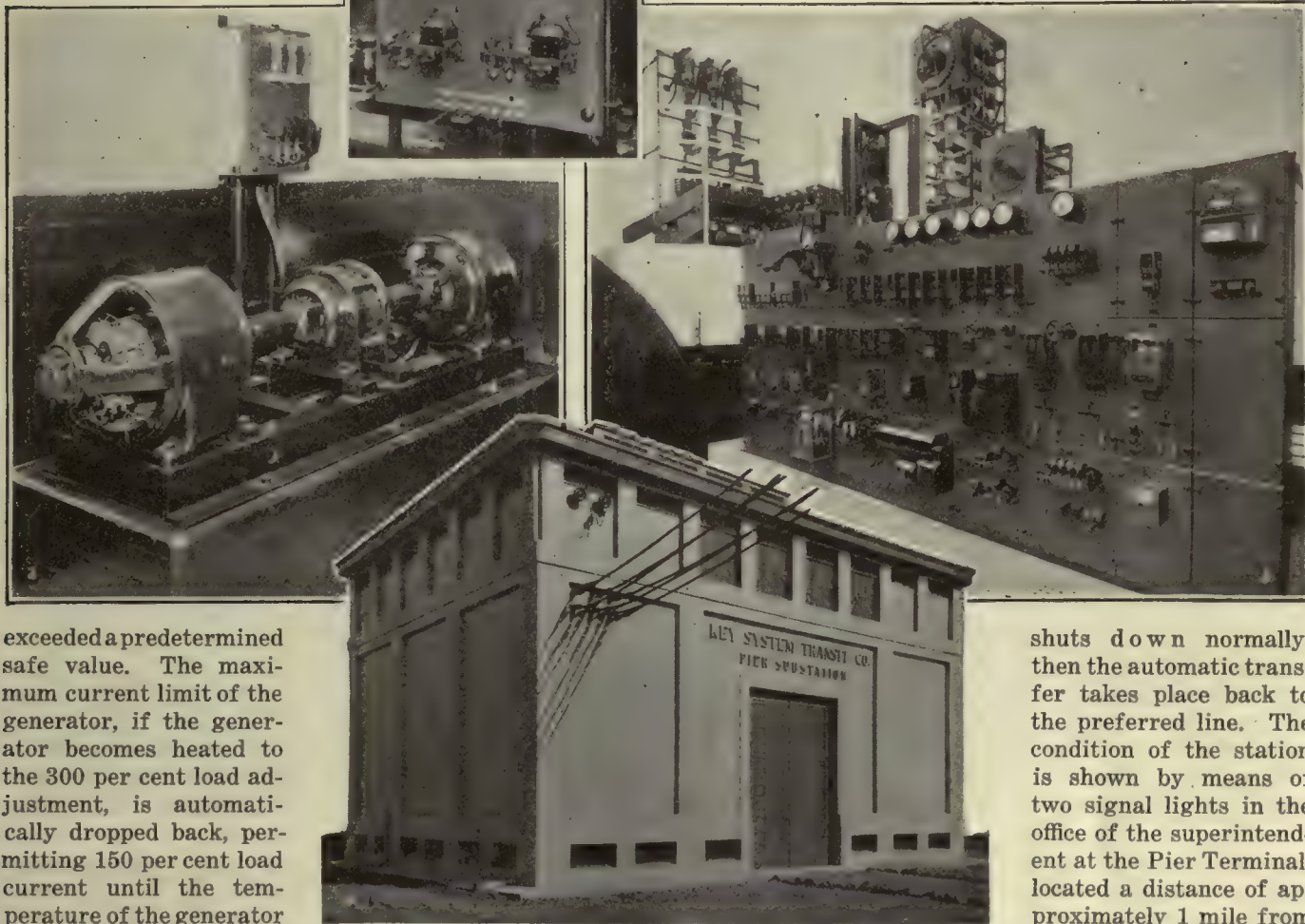
The 1,500-Kw. Synchronous Motor-Generator Set Installed in the New Substation of the Key System Transit Company
In the immediate foreground can be seen the two type J.R. high-speed circuit breakers that when closed short circuit a current-limiting resistance. Upon overload, these breakers will open in 0.015 second.

Company and installed by the Key System Transit Company's forces, consists of a 1,500-kw., 11,000-volt a.c. 600-volt d.c. synchronous motor-generator set and the necessary auxiliary and control apparatus to make its operation completely automatic after the starting impulse is given. Control power is obtained from either of two incoming 11,000-volt, three-phase, 60-cycle lines and the equipment is arranged to operate selectively on either of these lines.

The non-overloadable feature of the station is accomplished by the use of temperature relays. Constant voltage is maintained up to 300 per cent of normal load provided the temperature of the generator has not

The equipment is arranged so that it may be started either by remote control or automatically. Either of the incoming lines may be used in emergency. The equipment is designed to take power normally from the preferred line, and the closing of these disconnecting switches energizes the control power transformer and the line side of the line breakers. If the preferred line should fail when the station is not running two relays open and a third relay is energized so that the station may start from the emergency high-tension lines.

On the other hand, if the preferred line fails while the set is running, the station shuts down and starts up automatically on the emergency line. If while running on the emergency line the power returns to the preferred line, no change takes place until the station



Control and Main Switchboard Equipment Provides Many Automatic Devices for Substation Operation

No. 1. The temperature control panel on which are mounted the devices that prevent the motor-generator set from overheating.

No. 2. The motor-generator set that boosts or bucks the excitation field of the main generator, thus regulating the voltage.

No. 3. The main switchboard showing many of the automatic control devices for the automatic operation of the new 1,500-kw.

station of the Key System Transit Company.

No. 4. The substation building is constructed of concrete, non-reinforced. This building is well out in the middle of San Francisco Bay, being at the end of the earth fill of the Key System pier. The main machine floor is 7.7 ft. above high tide. Particular thought is given to salt water and salt air conditions and to the earthquake hazards. Concrete poles are used.

exceeded a predetermined safe value. The maximum current limit of the generator, if the generator becomes heated to the 300 per cent load adjustment, is automatically dropped back, permitting 150 per cent load current until the temperature of the generator reaches a second predetermined value. If the current remains at the 150 per cent value until the temperature of the generator reaches a third predetermined point, the maximum current is again automatically dropped back to the 100 per cent normal load current until cooling of the generator automatically makes possible the restoration of the higher limit points. If, however, the generator continues to rise in temperature at normal load, the set will shut down and be locked out. This condition will not obtain unless some abnormal condition prevails.

shuts down normally, then the automatic transfer takes place back to the preferred line. The condition of the station is shown by means of two signal lights in the office of the superintendent at the Pier Terminal, located a distance of approximately 1 mile from the station. A green light indicates the normal operation of the station, whether running or shut down. A red light indicates a lockout or that the station requires manual operation before it can be started.

The coil of the overload relay is connected to the secondary of a current

transformer, the primary being in the d.c. circuit. A potential is thus induced in the secondary only upon a very rapid rise of direct current, thus differentiating between a short circuit and a rapid increase in normal load. If the d.c. breakers are tripped out due to an ab-

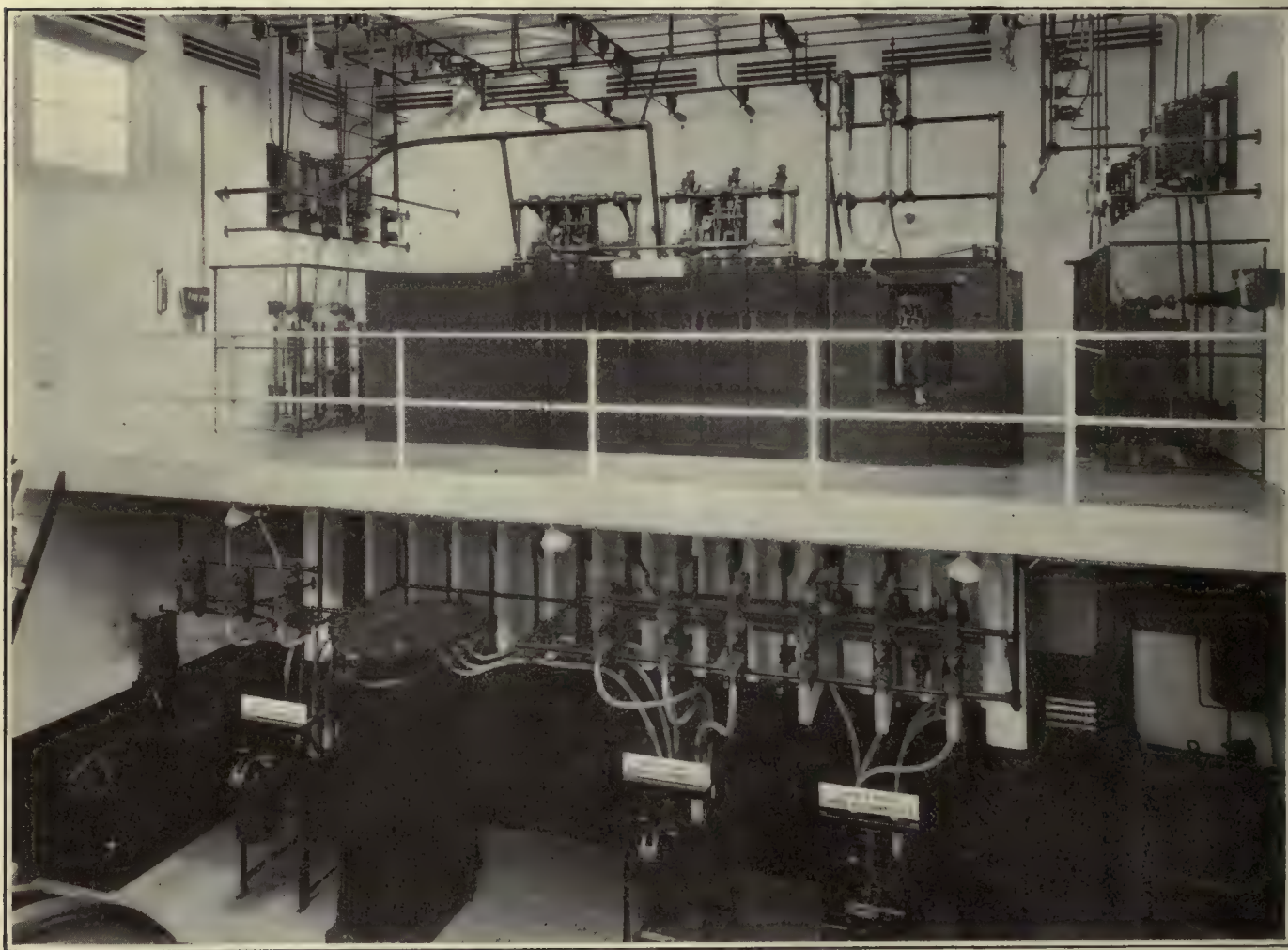
normal load condition or short circuit, the breakers will automatically close after a time delay of 30 seconds, provided the abnormal conditions have disappeared.

The set is shut down by operation of the time switch, or if the set were started from the remote control station, it must be shut down from that station.

A special feature in this installation is the voltage regulating equipment, consisting of a small motor-generator set, which either boosts or opposes the field of the d.c. generators, depending on the excitation of the small generator attached to the control set.

under-voltage connection to the d.c. bus, sudden increase in feeder current, reclosing feeders on short circuits or severe overload conditions.

The building is of poured but non-reinforced concrete. Only the slabs used for the horizontal compartment were precast. Transite inserts are used as barriers between the line and the load insulators of the oil circuit breakers. Construction of the switch cells with rigid structures at the end permits the oil circuit breakers being installed in compartments open on both sides, thus improving the conditions for maintenance.



Showing One Side of the New Key System Automatic Substation

In the lower left-hand corner is seen the motor-generator set used for regulating the voltage of the main d.c. generators. Near

this is the starting compensator, and on either side of the compensator are the three automatic a.c. switches used in starting. On

the gallery is the high-tension room, showing the H-type switch compartments and the bus structure.

Two type J.R. high-speed circuit breakers are connected in parallel in the negative side of the generator. Under short circuit conditions, the circuit breakers open in 0.015 second. These circuit breakers bridge a heavy resistance, which reduces the current to the commutating capacity of the generator.

The equipment is designed to afford automatic protection against sixteen abnormal or normal conditions that will prevent the proper operation of the set. These sixteen features are overspeed, low voltage on the a.c. lines, overload on the a.c. lines, motor field failure, wrong polarity, overheated bearings, single and reverse phase starting, overheated a.c. machine winding, underload or reverse power on the d.c. side, over-voltage on the d.c. side, d.c. ground or flashovers, d.c. under-voltage, single unbalanced or reverse phase operation,

The station was designed and installed by the railroad company under the general direction of the chief engineer. F. M. Morgan, construction engineer for the company, had complete charge in the field of the building construction and the installation of equipment.

Divided Seats for Lake Shore Line

CHANGES in the seating arrangement of cars of the Lake Shore Electric Railway will be made in the near future with a view to increasing passenger comfort. The present type of single seat which accommodates two persons will be replaced by a double seat with two individual spaces. One of the type now under consideration is made of green plush material, 38 in. long, with a small arm in the center to divide the space.



Side View of Altered Car of C. L. R.

Extensive Modernization Program for London Underground

Central London Railway Is Making Sweeping Alterations in Many of Its Wooden Trail Cars—Increased Operating Efficiency Is Hoped For—City and Hampstead Lines Have Adopted a New Standard for Tube Cars—Many New Cars Purchased

FOR several years the London Underground electric railway companies have been carrying out systematic improvements in the types of cars used on their lines. New cars purchased have been designed in accordance with up-to-date developments in car-building practice and much of the existing rolling stock has been modernized from time to time. With one notable exception all of the new cars which have been purchased in recent years have been necessitated not by the scrapping of old ones, but by railway extensions. The exception was in the case of the City & South London Railway.

When the small tubes of that company were enlarged to correspond to the standard tube diameter more than a year ago it was found necessary to retire all the then existing rolling stock, consisting of small wooden cars hauled by electric locomotives, these being replaced by

the regulation steel Underground cars operated on the multiple-unit system. A junction was constructed with the Charing Cross, Euston & Hampstead Railway near Euston and a service of through trains over the two lines started.

MODERNIZATION PROGRAM LIMITED TO CENTRAL LONDON RAILWAY AT PRESENT

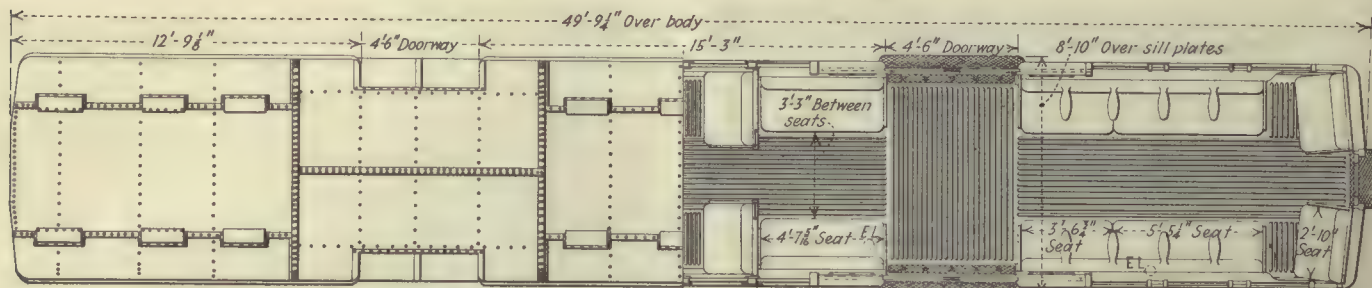
The present modernization of old cars of the underground lines extends only to the Central London Railway. A brief sketch of the work that is being done by this company appeared in the issue of the *ELECTRIC RAILWAY JOURNAL* for June 19, page 1050. With the exception of 24 steel motor cars, one of which is shown in an accompanying illustration, this rolling stock consists of wooden cars built mainly of teak, with metal outside sheeting, and has been in



Draft Screen at Side Entrances



Interior of C. L. R. Cars After Alterations



Floor Plan of Altered Car Adopted by Central London Railroad

service since 1900. Through careful maintenance these cars are still in excellent physical condition, especially as they have been operated entirely within the tubes and have thus escaped the rigors of unfavorable climatic conditions.

Prior to modernization the cars had open-end platforms and no side doors. The work being undertaken consists of closing in the end platforms and cutting two 3-ft. 3-in. doorways at points between the trucks on the trail cars and a double doorway 4 ft. 6 in. wide in the middle of the motor cars. These doorways will be provided with sliding doors, air-operated. The control of doors will be pneumatic, two small pipe lines being run throughout the train. So that closing of the doors may be sufficiently accelerated an electric control will be superimposed, but this control will be of a secondary nature and will not be essential to the door operation. All doors will of course be interlocked, giving a lamp signal to the guard when all doors are closed. The guard will in turn transmit a bell signal to the operator of the train. Operation of the door gear will be effected through the use of a vertical-faced rotary valve with a detachable handle. Piping to the pneumatic door system will be of copper as far as possible, to avoid trouble hitherto invariably experienced with new iron pipe due to scale, cuttings, etc.

DRAFT SCREENS ARE PROVIDED

Side doorways will be provided with semi-frameless draft screens of heavy plate glass attached between the side of the body and vertical grab poles running from floor to monitor. These grab poles constitute vertical struts and are made of steel pipe covered with thin

black fiber tubing where handling will occur. The design of the draft screens is shown in an accompanying illustration.

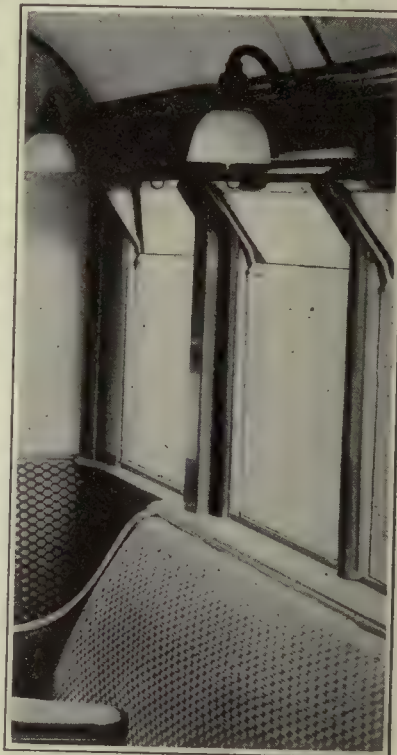
Existing framed windows in the cars are being replaced with semi-frameless main windows with semi-frameless inward-swinging top lights controlled by a dead-centered spring giving open and closed positions.

PECULIARITIES IN DOOR DESIGN

Owing to the small dimension between the cant rail and the floor on the tube cars it is necessary that the side doors should be curved at the top portion to conform to the roof line. This involves not only a discontinuous cant rail, which at the doorways must be replaced by a steel-built lower roof, but also makes it impossible to hang the doors from the top. The standard underground arrangement of a larger bottom roller on ball bearings and a sliding guide at the top has been adopted. In order to maintain the contour of the door these latter are being made of a cast aluminum alloy known as Alpac.

The 24 steel motor cars previously referred to are at present provided with closed ends fitted with hand-operated swing doors and swing side doors located near the forward or motor truck. These latter doors are controlled by means of a door check and are locked and unlocked automatically by the operation of the end doors. Eight wooden motor cars have recently been converted to the same type as the steel motor cars, but it is expected that the doors of the 32 motor cars will soon be converted to the standard pneumatically operated type.

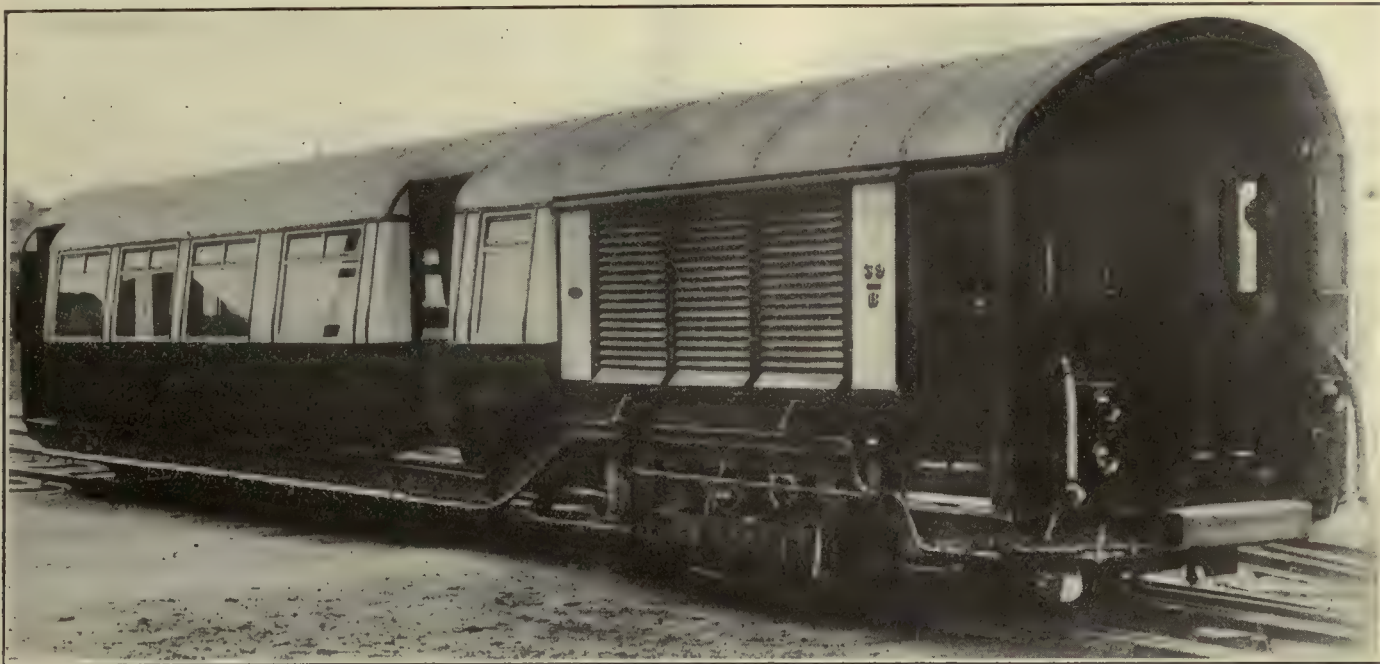
The seats in the modernized cars will be of a well-sprung type, upholstered in moquette, and will replace the old seats of pegamoid, rattan and wood. Additional cross seats will be provided at the newly constructed ends, a slight extension of the floor behind the headstock at the corners being made to accommodate these seats. The interior decoration of the cars will be in



New Top Glass for Ventilation



Interior View Before Alterations Had Been Made



One of the 24 Steel Motor Cars

green and mahogany, giving a bright and cheerful appearance. Exteriors will be painted red and green.

LIGHTING IS IMPROVED

Improvements are being made in the lighting arrangements of the cars. The present monitor rail lighting is being replaced by bracket lights with Super-flux type shades. These are located along the cant rail, except at the doorways, where similar lamps in ceiling fixtures will be used. Better distribution of light is obtained by making these changes.

The modernized units are being arranged with insulated negative wiring to permit of their being used at a later date, if required, with an insulated return, as is usual on the Underground railways. The negative wire is being temporarily earthed so that the cars can run on the existing earthed return used on the Central London Railway.

Some reconstruction of the trucks may be carried out, experiments in this direction being in progress at the present time. No change is being contemplated just now in the general motive equipment of the Central London Railway, although consideration is being given to the necessity of increasing train lengths and speed. This will eventually require intermediate motor cars and some change in control and other equipment. In all probability the present changes in the cars will make possible considerable improvements in operating schedules, due to the great facility with which loading and unloading may be accomplished.

CITY AND HAMPSTEAD LINES ADOPT A NEW STANDARD

For through service over the lines of the City & South London and the Charing Cross, Euston & Hampstead Railways 197 new cars were recently purchased. These are of an improved type designed to form a



A New City and Hampstead Trail Car

standard for future use. Since their delivery a further order for 127 similar units has been placed and delivery of a large share of these has now been made. They are to be used on the Morden and Kennington extensions, south of the River Thames, of the two railways named above. These lines now have a total of 505 cars, 324 of which are of the new standard.

To arrive at this standard much the same method was employed that was conceived in this country by the Grand Rapids Railway, namely, that of asking various manufacturers to build sample cars embodying all possible improvements in car design. Orders were



Interior of a Standard City and Hampstead Trail Car

placed with five leading British manufacturers of rolling stock for single cars, each to be to Underground specification with respect to dimensions and general principles of design, but to embody any special features that the manufacturers might themselves devise. A sixth car was built to specifications formulated by Underground engineers. These six cars were later submitted to the exacting test of service in the tubes and after an exhaustive trial a new design of car was evolved. This incorporated the salient features of the six test cars and is the standard type of rolling stock now in operation on the City and Hampstead lines.

It has been necessary to reduce the seating capacities somewhat in order to provide additional lateral seats. Passengers have indicated a marked preference to face in the direction of car motion, and this factor, together with the arrangements of the doors, causes the trail cars to have a seating capacity of 48 as compared with the previous capacity of 52. In the motor cars 30 seats are provided and in the control trailers 44, these figures comparing with the former 42 and 52 respectively. The seats, upholstered in a fawn-colored moquette, are of the spring-borne type. Special attention has also been given to the lighting, and the lamps, of shadowless design, are distributed in a manner that permits of a soft yet brilliant light being diffused equably through the car.

The arrangement of the doors governs the general principles upon which the City and Hampstead cars have been designed. Instead of platforms and collapsible gates at each end of the car, there are two pairs of sliding doors, as on the modernized Central

London cars, these being located to divide the interior of the car into three sections. This arrangement makes for expeditious ingress and egress, every seat being conveniently near a door. Each doorway provides an opening of 4 ft. 6 in., the total width of opening to the platforms per car being 9 ft., compared with the 6 ft. afforded by the narrow end doorways formerly used. Operation of the doors is pneumatic, practically similar to the system employed on the modernized cars described above.

A very noticeable feature of the new cars is the smooth and quiet performance in operation. The rattles and other harsh noises frequently concomitant with the operation of trains in tunnels have been largely eliminated. This improvement was effected through experiments and research conducted by Prof. A. M. Low, in which the use of "sound photographs" played an important part. The bogies are inclosed in asbestos shields and special packing devices have been adopted in the bogies themselves and in other parts of the car.

First Aid Teams Popular in Chicago

PUBLIC appreciation of the good work being accomplished by the First Aid Drill Teams of the Chicago Rapid Transit Company is evidenced by the fact that close to 66,000 persons, including hundreds of school children of impressionable age, have attended demonstrations of first aid methods in less than four months. Co-operating with the company's public speakers' organization the teams gave a total of 51 educational talks and demonstrations in the first three weeks of May.

In popularizing the work in the schools of the city, it is believed that not only will the pupils be equipped to render first aid, but they will also help to spread a knowledge of these humanitarian principles among others.

Dr. Hart E. Fisher, chief surgeon of the Rapid Transit Company, is in charge of the various teams.

Track and Line Departments Have Own Maintenance Shop



Work Room Shared by Track and Line Departments in Dallas

TRACK and line departments share a small maintenance shop for their equipment and tools in Dallas. As can be seen in the picture, the shop includes a metal saw, a drill press, grinding wheels, bench tools and equipment for testing meters used in the line department.



All Coupons at the Different Stores Were Distributed and Collected by Young Lady Employees

How Mrs. Shopper Rides*

Cleveland Conducts Survey of Means by Which Shoppers Reach Principal Stores—
Employees of Stores Collect the Data—Electric Railway
Found Principal Agency Used

By Ralph W. Emerson

General Manager Cleveland Railway

ONE of the fundamental factors in determining the best method to pursue in handling the problem of traffic congestion in the downtown area in any large community is, first, to determine the relative importance of the different modes of transportation.

A very large percentage of the people entering and leaving the main business section of a city are shoppers in retail stores. Inasmuch as retail stores front for the most part on congested main thoroughfares, a knowledge of just how these patrons reach the stores will enable city authorities and traffic divisions of the police department to determine how congested streets should be used. Such information also will have a commanding influence upon retail merchants in securing their co-operation with the city and its traffic officers. Merchants unfamiliar with the causes and effects of traffic congestion are opposed to the total or even partial restriction of automobile parking. This attitude on their part is largely due to the fact that they see hundreds of automobiles pass their stores and relatively few street cars, and they have gained the impression that automobiles transport the greatest number of their patrons.

Unlimited parking or even the much-abused one hour privilege has brought about a solid line of autos on both sides of our main thoroughfares in the congested district, the occupants of which are not necessarily trading in the store in front of which their auto is parked. Later arriving auto patrons, unless chauffeur

driven, do not have ready access to the store where they wish to trade and must go elsewhere. This defeats the very thing the store owner had hoped to accomplish by his insistence that parking be permitted. If, however, he is a thoughtful man he will take cognizance of what is daily transpiring and awake to the fact that the greatest number of his auto patrons are not benefited by the parking privilege.

PARKING DRIVES SHOPPERS AWAY

Promiscuous parking is the greatest contributory cause to congestion and the slowing up of moving vehicles. Herein lies a very real danger menacing downtown merchants. It is a danger that many of them fail to see, namely, the danger of decentralization, or driving business to the outlying and less congested business centers. It follows that street car riding shoppers will become more and more reluctant to shop downtown if the progress of the street car is impeded to the extent of exhausting the patience of the shopper by taking unreasonable time. It also follows that the shopper who drives her own auto dreads the distasteful trip downtown as congestion increases and opportunity to park her auto becomes less and less.

If that is true, then the future of our downtown merchants in the larger cities is dependent upon the rapidity and convenience with which their patrons can reach their stores. Discovering and believing that to be certain truth, many of the larger stores in the centers of business have provided downtown garages for their

*Abstract of paper at annual meeting of Central Electric Railway Association, S.S. South America, June 28-July 2, 1926.

customers, using either motor coach service to and from their stores or supplying chauffeurs to drive private cars to and from their garage.

Many attempts have been made by those vitally interested in the question of traffic congestion to conduct a poll similar to that under discussion in various cities throughout the country. For the most part these polls have failed, or have not been representative, for the reason that it was found difficult or impossible to enlist the co-operation of local merchants. Apparently some merchants fail to realize the importance of looking at facts or of giving them a degree of consideration adequate to influence their attitude toward parking. They are fearful of agitating the matter because they cannot determine beforehand in their own minds what might be the result of restricted parking. Existing conditions are satisfactory to them and any change in the means of travel of various classes of their patrons is unwelcome. Any traffic poll must depend for its success upon a sufficient number of merchants of diversified interests willing to discover how existing conditions may be changed into new and more orderly and more universally beneficial situations.

CLEVELAND CONDUCTS SUCCESSFUL SHOPPERS' POLL

In the city of Cleveland a poll recently made resulted most successfully because it had the approval and enjoyed the co-operation of the forward-looking merchants' association, known as the Retail Merchants' Board, which is a branch of the Cleveland Chamber of Commerce. At the request of the Cleveland Railway, the secretary of the Retail Merchants' Board called a meeting of all members. The purpose of the poll was presented to them, together with a statement that the railway company would bear the entire expense of such a survey, whereupon the board appointed a committee to co-operate with the railway company in the working out of plans and details of the survey. It was decided that the poll would be carried on in 22 stores. These stores were not only the largest in Cleveland, but represented the greatest diversity in goods which they sold. It was further decided to carry on the poll on three days of the week, namely, Tuesday, Thursday and Friday, for the reason that these days are probably the three heaviest days of the week at this time of the year. The dates decided upon were June 1, 3 and 4.

After a consideration of the various ways in which this information might be gathered, it was decided to distribute to the store patrons a ballot with a perforated tear-off corner, as being simple and not apt to cause congestion at store entrances.

The four perforated corners of the ballot, as shown, bear the following language:

1. I came downtown in a motor coach.
2. I came downtown in a street car.
3. I came downtown in a private automobile.
4. I walked downtown.

The work of the survey was conducted by 80 young ladies employed by the various stores affected by the survey. On the Saturday preceding the survey a meeting was held in the Chamber of Commerce library, when these young ladies were given instructions fully informing them as to the purpose of the survey, details of carrying it on and the work which they were to do. In passing, it is only fair to say that the large vote which was secured was due in no small measure to the high caliber of the clerks assigned to this work and the

painstaking effort which they put forth to get out as large a vote as possible. These girls were identified by silk streamers bearing the words "Traffic Survey."

Prior to the first day of the poll, ballots and boxes for the reception of coupons bearing the words "Please Deposit Traffic Survey Ballots Here" were distributed to the 22 stores. With the opening of the stores on Tuesday morning these ballots were handed to the shoppers as they entered the store with the courteous request that the patron read the ballot while in the store. As the patrons left other young ladies requested them to deposit their ballots in the ballot box, which was conveniently and conspicuously located at the exit door.

The ballot used by the patrons for the three days was pink in color. A green ballot was supplied to the



Records Were Taken by a Simple Form of Ticket with Four Coupons

employees in the stores affected, and they voted on the first day only. On Friday, the third day of the survey, Woolworth's largest 5 and 10-cent store was added, making 23 stores for that day. A poll was also taken in the Hanna Building, as being a typical downtown office building.

The survey was preceded by considerable newspaper publicity, stating the purpose and explaining the ballot, so that those voting were more or less prepared for it. The distribution of the survey is shown in Table I.

TABLE I—TOTALS OF GREEN AND PINK BALLOTS AT DIFFERENT CLEVELAND STORES

Firm Name	Buses	Per Cent	Cars	Per Cent	Autos	Per Cent	Walked	Per Cent	Total
Ames.....	434	11.9	2,500	69.0	538	14.8	154	4.2	3,626
Bailey.....	545	6.5	6,401	76.2	1,118	13.3	343	4.1	8,407
B. R. Baker.....	103	8.0	519	40.4	595	46.1	74	5.7	1,291
Webb C. Ball.....	34	7.7	194	44.0	187	42.4	26	5.9	441
Bedell.....	945	31.9	1,418	47.9	489	16.5	115	3.8	2,967
Bowler & Burdick	11	6.9	60	37.5	83	51.8	5	3.7	160
Geo. H. Bowman	224	6.8	2,578	74.4	561	16.1	104	3.0	3,467
Browning, King..	76	12.6	267	44.2	193	32.0	68	11.2	604
Burrows Bros.....	130	7.7	950	56.7	471	28.5	122	7.3	1,673
Chandler & Rudd	180	8.3	1,570	72.4	333	15.3	89	4.1	2,172
W. B. Davis.....	184	8.8	497	52.1	342	35.9	31	3.2	954
Halle Bros.....	771	9.7	4,269	53.5	2,657	33.3	288	3.6	7,985
Higbee Co.....	2,016	13.6	9,065	61.5	3,301	22.4	350	2.4	14,732
Kinney & Levan..	311	16.4	898	47.4	605	31.9	81	4.3	1,895
Lindner.....	389	15.0	1,238	48.0	818	31.7	135	5.2	2,580
May Co.....	1,256	7.0	13,151	73.8	2,812	15.7	633	3.5	17,852
Oppenheim-Collins	160	10.8	905	61.4	334	22.6	74	5.0	1,473
Siegels.....	61	11.2	322	59.5	137	25.2	22	4.1	542
.....	165	9.2	1,113	62.1	429	23.9	85	4.7	1,792
Sterling & Welsh.	146	8.3	786	44.8	732	41.7	91	5.2	1,755
Stone Shoe.....	133	9.5	911	65.2	296	21.2	57	4.1	1,397
Wm. Taylor Son..	914	8.6	7,301	68.4	2,090	19.6	359	3.4	10,664
F. W. Woolworth	165	7.1	1,701	73.0	320	13.7	144	6.1	2,330
Hanna Bldg.....	220	8.5	1,332	51.3	872	33.6	172	6.6	2,596
Totals.....	9,473		59,946		20,313		3,623		93,355
Per cent.....		10.1		64.2		21.8		3.9	

The figures given in Table II indicate that of the combined shoppers and employees voting only about one in five uses a private automobile.

STORES SHOW DIFFERENT PERCENTAGES

As might be expected, the percentage using the various modes of transportation varied considerably in the different stores.

The highest percentage using motor coaches was at the Bedell Company, a high-grade women's apparel shop, where 33.16 per cent of the 2,826 voting used the motor coach. The lowest were patrons of the Geo. H. Bowman Company, a china and glassware store, where 6.48 per cent used motor coaches of the 3,395 voting.

In this connection it might be well to state that the railway company operates but one motor coach line through the territory affected by the 23 stores.

The largest percentage using street cars was at the Bailey Company, a large department store, where 75.48 per cent used the street cars of the 7,757 voting. This

TABLE II—SUMMARY OF FIGURES GIVEN IN TABLE I

Shoppers voting.....	85,657	Employees voting.....	7,698		
		Motor Coach	Street Car	Auto-mobile	Walk
Shoppers, number.....	8,910	53,738	19,551	3,458	
Shoppers, per cent.....	10.46	62.74	22.82	4.04	
Employees, number.....	563	6,208	762	165	
Employees, per cent.....	7.31	80.64	9.9	2.15	
Total, number.....	9,473	59,946	20,313	3,623	
Total, per cent.....	10.15	64.21	21.76	3.88	

is without doubt low, for the reason that many of the patrons in this instance were foreigners who did not understand and could not be made to understand what the ballot was for. Without doubt most of them were car riders. This is further borne out by the fact that in the same store more than 90 per cent of the employees used the railway facilities.

The smallest percentage using the street car was at the Sterling & Welch Company, a very high-grade house-furnishing store, where 36.74 per cent of the 1,410 voting used that mode of transportation. The largest number of patrons using private automobiles was also at the Sterling & Welch Company, where 48.29 per cent came in this way.

An interesting feature of the survey is the fact that more than 4 per cent of the patrons in the downtown stores walked to the store, the largest percentage being 12.01 per cent, at Browning, King & Company, and the smallest being 2.48 per cent, at the Higbee Company.

No confusion and practically no delay were found at store entrances, where the ballots were distributed, and in evidence of the satisfaction of merchants it may be noted that not a single one offered a word of adverse criticism, while many of them voluntarily presented letters of commendation.

The results obtained are as accurate as can reasonably be expected and they showed conclusively that the facilities of the local transportation company carry the bulk of shoppers.

SURVEY SUGGESTS POSSIBILITIES OF IMPROVEMENT

Immediately upon publication in the local papers of the figures herein given agitation of radical parking changes was enlivened. Councilmen, the secretary of the Cleveland Automobile Club and the Traffic Commissioner of the Police Department were convinced that a revision with new restrictive clauses of local parking regulations was demanded. The sentiment prevailed

that not only is it necessary to eliminate the one hour parking provision on main thoroughfares of the business center of the city, but also the unlimited parking on side and back streets. On these latter streets it is believed an opportunity might be given for shoppers and others to park for brief periods of time.

It is hoped that, with the figures of this poll at hand, disputes and misunderstandings as to the relative importance of the different modes of transportation may be answered and that the survey may act as a starting point to bring about a more equitable use of our main thoroughfares.

Municipal Railway Talk Over Radio

Superintendent Henderson at Seattle Explains Some Phases of Local Operation Little Appreciated by General Public—Citizens Owe It to Themselves and the City to Use Lines Whenever Possible

D. W. HENDERSON, general superintendent of the street railway division of the Department of Public Utilities of the city of Seattle, Wash., has been talking over the radio to the people of Seattle about the municipal railway. He admonishes the public to remember that the street railway is not owned or controlled by a few capitalists. Neither is it owned nor operated by a clique of politicians, but it is owned by the entire public of the city of Seattle. Mr. Henderson said that in order to make it a success and that the very best service possible might be given it is the duty of residents as citizens to patronize the cars and to boost it wherever they can, "as the street railway system of the city of Seattle is at this time one of its best assets."

Mr. Henderson said in part:

"On April 1, 1919, the city of Seattle took over the operation of the street railway system of the Puget Sound Traction, Light & Power Company, consisting of about 220 miles of track, 507 street cars (including freight equipment) the carhouses and shops necessary for the operation of the road and the employees necessary for operating the lines. The city gave in payment for the property \$15,000,000 in utility bonds bearing 5 per cent interest. When the city started operating it had no capital to work upon except the revenue collected from the passengers. Previous to the purchase of the road, those in charge at the City Hall held they could operate the lines on a 5-cent fare, pay all operating expenses, meet the principal on the \$15,000,000 of bonds and interest thereon and, in addition, give the employees an increased rate of wage over and above that which was being paid by the traction company.

"The first payment on the principal of the bond issue was not to be made until March 1, 1922, but it was necessary to pay the interest every six months. On April 1, 1919, there were 1,876 employees in the service of the railway; on April 1, 1920, there were 2,208; on Dec. 1, 1925, there were only 1,891. Instead of having an amount of money sufficient to pay the interest on the bonds and to meet the operating cost at the end of the first year's operation, there was a deficit of more than \$1,000,000.

"There has been paid to the bondholders the sum of \$5,256,325 in interest and by March 1, 1926, there will have been paid \$4,225,000 of the principal. Up to date

we have been able to meet all of our bills and obligations, partly due to the fact that the banks of the city were willing to carry our warrants from time to time so as to enable us to meet expenses. Whether it be private or public, there is no large organization such as this which does not at times have to borrow in order properly to handle its business.

"It was plain after the road had been operated for a year that the 5-cent fare would not insure revenue sufficient to meet the obligations which were required and it was found necessary to increase the fare. The first increase in fare was in July, 1920, when the rate was raised to four tokens for 25 cents or 10 cents cash. We operated under this rate until Jan. 9, 1921, when the fare was again increased to three tokens for 25 cents or 10 cents cash. On March 1, 1923, in order to satisfy some citizens who were still under the belief that the system could be operated on a 5-cent fare, the fare was again reduced to 5 cents with a charge of 1 cent for transfer. The opinion was that by reducing the fare enough extra riders would patronize the cars to increase the revenue to meet the obligations. In order to do this, it was necessary to increase the riding 45 per cent. But, from the experiment, we found there was an increase of only 7 per cent, and on June 16, 1923, after 3½ months trial of 5-cent fare, the previous rate of three tokens for 25 cents or 10 cents cash was restored. This experiment caused a deficit of \$500,000, and we have been trying our best to overcome this deficit since that time. Under this last rate of fare, however, we were able to secure revenue sufficient to meet the operating costs, the interest on the bonds and the payment of the maturing principal. One thing you must remember—that few large organizations ever attempt to redeem bonds as the Seattle Municipal Street Railway is doing with its bond issue. It is necessary for us to redeem each year the sum of \$843,000 of bonds and in addition pay interest every six months. You must also bear in mind that the Supreme Court of the State of Washington ruled, in what is known as the '14 Taxpayers' Suit,' that no general fund money of any kind can be used for the maintenance or operation of the street railway system of the city. Many people are under the impression that they are paying taxes in addition to the car fare. No taxes have yet been

paid by the public for the maintenance or operation of the railway.

"Lately there has been considerable agitation regarding the installation of a rapid transit system as part of the street railway. Subways in other cities have cost in the past more than \$11,000,000 a mile. Before any steps are taken to build any rapid transit system in the city of Seattle, the matter should be very thoroughly investigated by competent engineers. Unless you have traffic sufficient to load the rapid transit cars practically at all times, there is no chance of any reduction in fare.

"There has been considerable talk about the street railway system becoming obsolete and that buses would take the place of street cars. Experts have come to the conclusion that in any city with more than 100,000 population the street car is necessary to handle mass transportation. There is no question but that buses can be used to good advantage in most any city to feed the street car lines. We are operating buses in the outlying districts in conjunction with the railway and, since they have been in operation, the buses have built up the districts in which they operate. By working both the street car and the bus, there is no reason why any city should not have the service to which it is entitled."

Caring for Increased Traffic in Jacksonville

Business Activity of Florida's Largest City Reflected
in Street Railway Traffic—Spray Painting
Used Extensively for Cars

CHIEF among the transportation problems in Jacksonville, Fla., during the past year has been to know how to take care of the increased traffic. The reason is that Jacksonville has not only participated in the real estate development of the other cities in Florida, but it has also been the gateway to all of the state for automobile and railway traffic except for the far western section of the state near Pensacola.

Up to last September the company had been in the hands of a receiver since 1919. Then the receivership was lifted and J. P. Ingle, who had been receiver since April, 1925, and previously had been general manager



Island Platforms with End Lights, Installed by City, Speed Boarding and Alighting



Double-Truck Car Converted to One-Man Operation



Main Carhouse in Jacksonville

under the receiver, was appointed general manager of the property. During the receivership the city of South Jacksonville constructed an extension to the Jacksonville system as a municipal enterprise and had purchased sufficient cars to operate it. This track and these cars were then leased by South Jacksonville to the Jacksonville Traction Company.

The rolling stock of the Jacksonville Traction Company consists of 107 cars, of which 57 are single-truck Birney cars. The company has also rebuilt 22 of its double-truck cars for one-man operation, adding complete safety equipment.

CAR EXTERIORS ARE SPRAY PAINTED IN A SINGLE COLOR

Yellow has been adopted as the standard color for the entire car except the roof, and very little striping is used. This solid coloring was not adopted because it was considered more attractive than a combination of colors for the car body, but to shorten the time that cars being repainted have to be in the paint shop. Spray painting is used for both car body and roof. While the body is being sprayed the windows are covered with bar soap which is rubbed on from a cake. After the spraying is finished this soap, with any paint which has lodged on it, can be taken off in a few minutes with a putty knife. The only brush work used on the car, except for the striping, is on the lower part of the roof to make an even edge where the roof and body spraying meet. About 30 minutes is required for each coat of paint, and the company gives each car two coats at a car-painting period.

To distinguish the old rear-entrance cars from the new front-entrance cars, the Brooklyn design of an irregular star on the front dash was first tried. This has been abandoned for the words "Rear Entrance" in black and a curved arrow pointing to the rear. Both lettering and design appear on the side of the dash nearest the curb.

As on several other properties under the management of Stone & Webster, considerable use is being made of Miller sliding shoes instead of trolley wheels. No change was required in the overhead construction nor is any grease used on the trolley wire.

The fares charged are 10 cents for a single ride and five tokens for 35 cents. In addition, a weekly pass is sold for \$1.25.

A Ten-Year-Old Pretzel

A LITTLE more than ten years ago the first issue of the *Pretzel*, published by the Reading Transit Company, Reading, Pa., was placed in the little boxes in the street cars. Since that time the publication has never missed a single issue, appearing every Friday morning. The *Pretzel* has always endeavored to be a pleasant traveling companion. Almost every issue contains an item or two giving patrons a "close-up" of the work of the departments connected with the operation of the railway.

In its weekly chats the paper has acquainted car riders with some of the railway's problems, related a number of accomplishments, thanked riders for patronage and compliments, accepted and quite frequently profited by criticisms. The *Pretzel* has enjoyed a steady increase in circulation. The first week that it was placed in the cars about 20,000 were taken from the boxes. More than 32,000 copies are now printed every week. In addition to the thousands which are read in the cars, many are preserved and mailed to the friends and relatives of patrons in other cities. The *Pretzel* has a regular mailing list of approximately 200 names. The little four-page paper is sent to practically every state in the Union. The *Pretzel* starts its second decade with a determination to cling to its purpose as announced in its first issue—that of being a friendly, chatty traveling companion for street car riders.

Illuminated Train Number Boxes in Dallas



Convenient Train Number Device Used by the Texas Electric Railway

ILLUMINATED train number boxes, similar to those shown in the illustration, are used on the cars of the Texas Electric Railway, Dallas, Tex. Four sets of numbers are mounted on cloth rolls and can be turned by the handles projecting from the sides. The numbers can be seen plainly by day and are illuminated by lamps at night.

This device has facilitated identification of cars by the supervisory force.

The Readers' Forum

The Grand Rapids Bonfire Was a Serious Mistake

INDEPENDENCE, July 4, 1926.

To the Editor:

I see by your issue of July 3 where Grand Rapids had a bonfire and burnt up what they called antiquated equipment. They made a very serious mistake in doing this. These cars might have been "antiquated" in Grand Rapids, but they would have been, according to the illustrations, very modern in my town and they should have given them to the traction company.

By the pictures some of the burnt cars had as many as eight wheels onto them and all the wheels on each side of the car showed as being on. In my town some of the cars that have three wheels are able to negotiate the hills when properly loaded.

Out of more than 130 cars that my town has got there are at least 57 varieties, and it has been suggested that each one of the 57 varieties be segregated and used to advertise one brand of Heinz's pickles into it as the oldest variety just corresponds in age with the time Mr. Heinz put out his first pickle.

Sometimes these cars in my town stop for no apparent reason when going up a hill, but never whilst descending. The other day the writer was onto one of these which stopped ascending a hill, and after all other ordinary expletives had failed the motorman says to the car "gid-dap" and off it started. He told me his grandfather drove that car in 1851 when it had mules onto it, which probably accounted for its peculiar proclivities.

A. NUISANCE.

Read "Electric Railway Practices in 1925"

BOSTON ELEVATED RAILWAY

Offices of the Public Trustees, Park Square Building,
31 St. James Avenue

BOSTON, MASS., July 1, 1926.

To the Editor:

I have noted with interest your review of "Electric Railway Practices in 1925" in a recent issue of the ELECTRIC RAILWAY JOURNAL, with particular reference to the similarity in names between this book and "The Handbook of Modern Electric Railway Methods and Practices, 1925." While greater differentiation in title might be desirable, the plan and scope of the two books are so different that there should be no confusion in the minds of electric railway executives if they will study them both carefully.

Now that "Electric Railway Practices in 1925" has been distributed widely, I would like to emphasize the importance of a careful reading of the book by all responsible railway men. The presentations this year were remarkable in comprehensiveness and in the quality of the practices which were described. If the reading of the book gives to a manager a single new idea it will be worth the few hours of his time that is necessary.

It seems to me that a manager might well expect of his department heads that they also familiarize them-

selves with the contents of the book. The Charles A. Coffin Foundation is expending a substantial sum to put this digest into the hands of every man who can use it efficiently. By prompt co-operation of the technical press the best practices disclosed in the presentations were made available to the industry some months ago. This volume, as you state, "with the information carefully collated and grouped under subject heads, gives another use for it (i.e., the material in last year's briefs)."

I hope that the similarity in names between the two books referred to will impel a close examination of both by the industry to determine wherein they are alike and wherein they differ.

HENRY H. NORRIS,

Editor "Electric Railway Practices in 1925."

Greater Care Is Needed at Steam Railroad Crossings

CLEVELAND, OHIO, June 28, 1926.

To the Editor:

It is common knowledge that most street railway companies at one time or another have suffered loss because of carelessness or neglect on the part of crossing flagmen. My experience, by observation over a period of several years, is that 95 out of 100 street car conductors in flagging a car across railroad tracks fail to look both up and down the tracks before so doing, and a good proportion of them walk straight across the tracks without ever giving a thought apparently to the need of looking to their right or left. This lack of attention on the part of certain employees is often the cause of the company paying out large sums of money for damages.

At a certain railroad crossing protected by gates operated by a railroad watchman the traction company also had a man on the job. In one instance a street car pulled up to the crossing and stopped. The gates were up at this time and the traction company flagman was in a sitting position, apparently in a trance. The railroad gateman came out of his shanty and tapped this fellow on the shoulder, at the same time pointing up the track toward an approaching passenger train. Thereupon the fellow rose from his seat and by motion of his flag in hand indicated to the car motorman that he was to wait.

Toward the close of the World War three railroads entering Akron, Ohio, were drawn into a controversy with the city because they had closed up and fenced a dangerous railroad crossing, after first having built a substantial and satisfactory overhead bridge. The small merchants and workmen of that end of town protested that the crossing should be reopened. After proposals and counterproposals had been exchanged between city and railroads, an agreement was reached whereby the crossing was reopened, and one railroad installed gates and furnished watchmen and gatemen. It was further agreed that this company would have complete supervision of the crossing, including the employees. The city's contribution was in the form of a check mailed to the railroad company once a month, the amount being equal to one-half the pay of crossing attendants.

This suggests one possible way in which better protection may be secured at steam and electric railway crossings.

W. H. CAMERON.

Maintenance Notes

Trolley Tap Does Not Interfere with Car Operation

COMPRESSED air for pneumatic track tools is obtained by the United Railways & Electric Company, Baltimore, Md., from an electrically operated compressor placed at the side of the street. Power for operating the compressor comes from the trolley wire by a specially designed copper hook being placed over one of the trolley ears, as shown in an accompanying illustration. Current is carried from the hook to the compressor through an insulated wire attached to a light bamboo pole. With the hook in position over the trolley ear the rod is tied back to one of the span wire supporting poles in such a way as to be out of the way of passing cars, and the hook over the trolley ear permits passage of trolley wheels, so that car operation is not interfered with. This makes it unnecessary to remove the hook from the wire until the position of the compressor is changed.

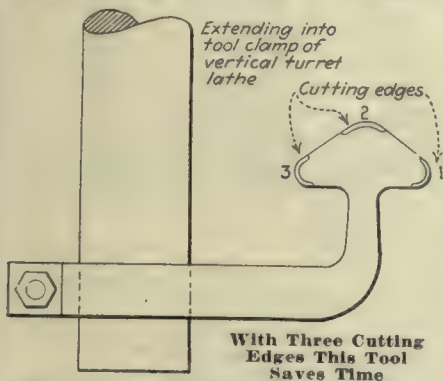


Trolley Tap Prevents Interference with Car Movements in Baltimore

castings come to this lathe finished operator at random and placed in the on the faces forming the split. Two of vertical chuck. The first operation is these sections are picked up by the to machine the outer side of the

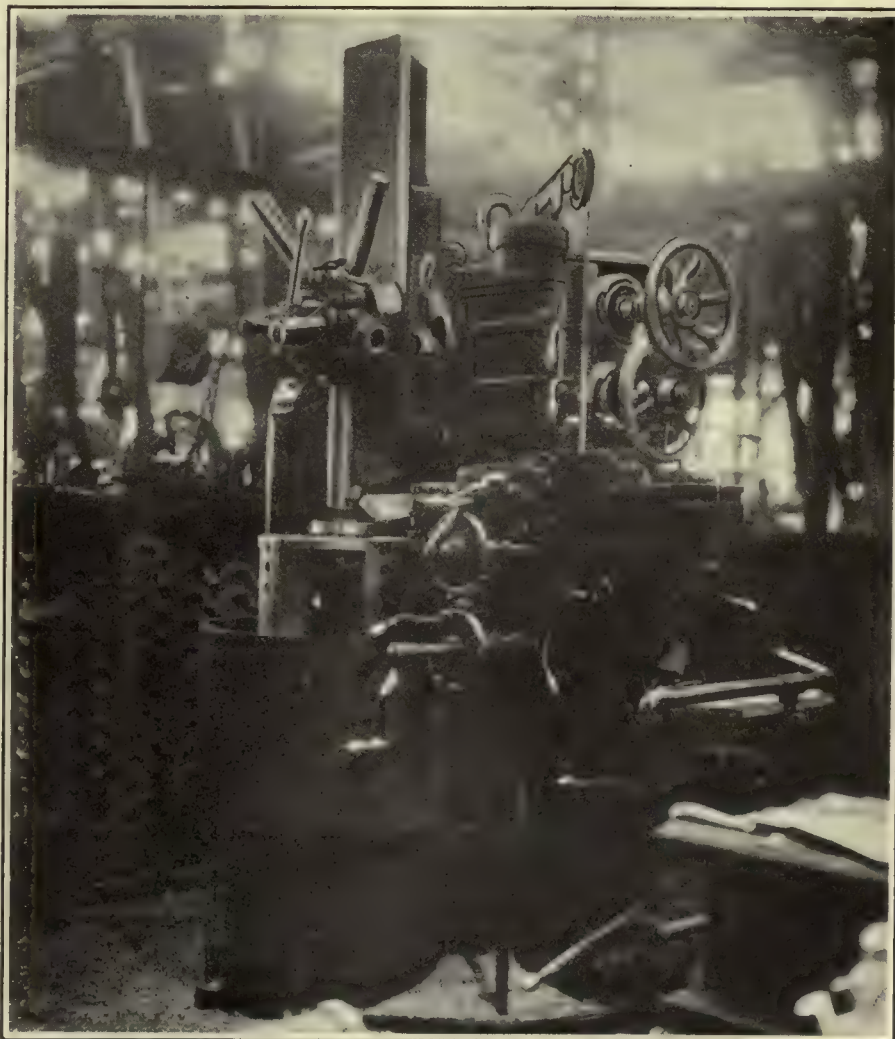
Machining Performed in One Operation

IN THE shops of the United Railways of St. Louis has been installed a new Bullard vertical turret lathe that is used almost exclusively in the machining of the split bronze axle bearings made by the railway.



Special tool constructed in the shops of the United Railways of St. Louis, with three cutting edges for facing the inside, bottom and outer side of split bearings.

The machine is a remarkable time-saver, requiring only from five to ten minutes per pair to turn out the bronze axle bearings. The bearing



Bullard Vertical Turret Lathe for Machining Split Bearings

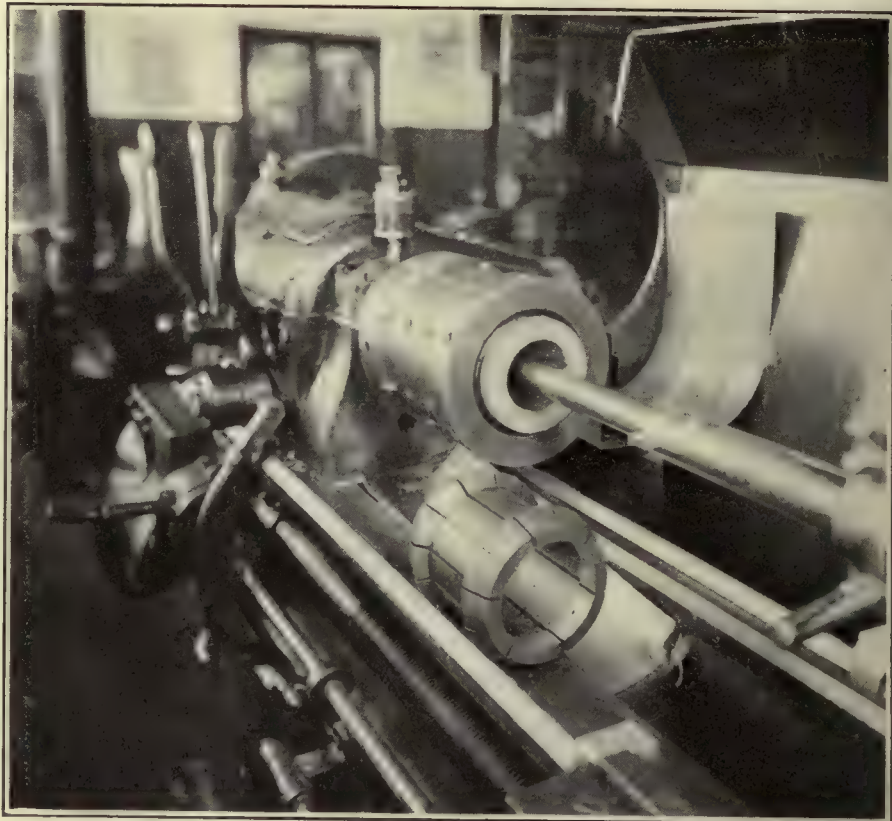
bearing collars and a second tool, mounted on the turret, machines the face of the collar. The third tool has three cutting engines, the general design of which is shown in the accompanying sketch.

In machining, the tool is first run down the inside of the split halves of the bearing, accurately machining the bearing surfaces on the inside, using cutting edge No. 1. The tool is then moved sideways, cutting on edge No. 2, as shown in the diagram, which machines the bottom of the bearing as it stands in the chuck. The tool is then raised and cutting edge No. 3 machines the outer surface of the lower end of the bearing, thus completing the machining operation.

Whipping Weeds Off the Right-of-Way

FOR several years the Texas Electric Railway, Dallas, Tex., has used a home-constructed device to destroy the weed growth on the roadway by mechanically tearing the weeds to pieces. The Texas Electric maintenance crew goes over the right-of-way once or twice a year with this equipment, at a cost that averages 90 cents per mile per cutting. If the whipping process is done before the seeds develop too far, they can be destroyed effectively in this manner.

As shown by the illustration, the equipment is both electrically and gas driven. The gasoline engine, taken from a used automobile, propels the equipment along the track at a speed of from 6 to 10 m.p.h. The weed-whipping device is driven by means of a motor operated from the trolley. This weed-whipping de-

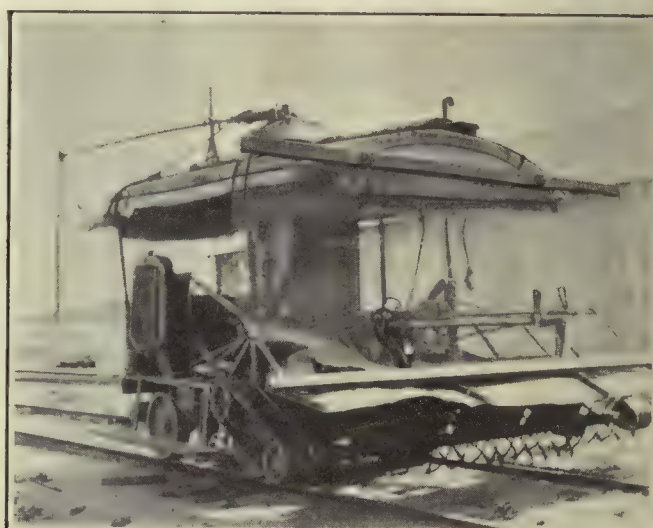
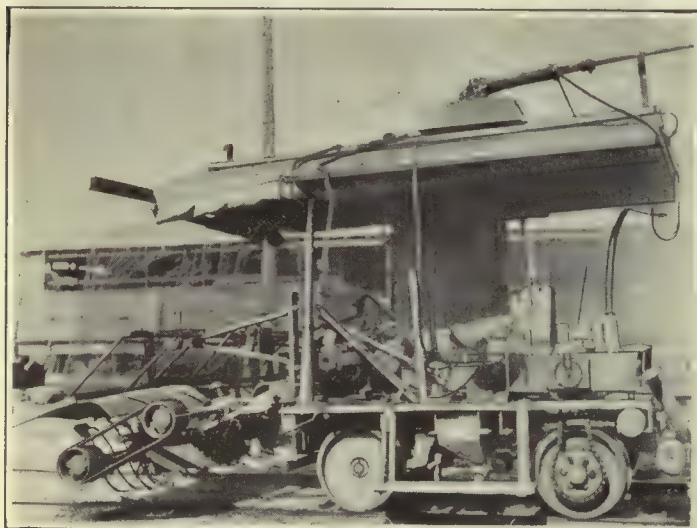


A Special Type of Chuck Facilitates the Boring of Armature Bearings in the Shop of the Department of Street Railways in Detroit

vice consists of a rod drilled at numerous points through which small sections of about $\frac{1}{8}$ -in. diameter steel cable are inserted. The cable is then cut off to the predetermined length and wedged in place by means of small metal liners so that the wires will not throw themselves out when revolved. Since these wires wear out, the fastening device or wedge must be one that can easily be loosened so that new wires can be put in. To protect the equipment and the operators who ride in the car, a large metal fly screen is supported in the front.

Special Chucks Assist Armature Bearing Work

PROVISION is made for boring armature bearings so that the bore will be centered accurately in relation to the outside finished surface by the Department of Street Railways, Detroit, Mich., which uses a special chuck. The bearings are bored in a lathe by means of a horizontal boring bar. The chuck in which the bearings are held during the boring operation consists of three parts. The main outside section is fastened to the tailstock of



Weed Whipper Used by Texas Electric Railway

At left, side view of Texas Electric weed whipper, showing electric motor and belted device for driving the weed whipper brush hung in front of the apparatus.

At right, front view of electric weed whipper, showing the gasoline engine unit which drives the vehicle. An electric motor revolves the weed whipper and cuts the tops off the weeds.

the lathe. A center portion holds the bearings and an end ring is used as the clamping medium.

In the accompanying illustration one of the central portions in which the bearings are placed is shown lying on the bed of the lathe. It will be seen that this has two flanged ends which are beveled. This collar is split lengthwise by a number of saw cuts. The saw cuts do not run the entire length, however, and those which extend from one end are alternated with those which start at the other. When the slotted collar is placed inside the chucks pressure to clamp the bearings is obtained by

the end collar bearing on the beveled section at the front end while the rear end is pressed against a similar beveled section of the main outside casing. By screwing up on the end ring sufficient pressure is obtained so that the bearing is clamped securely and accurately. Slotted collars of various sizes are used to take care of different types of bearings. The outside portion of the slotted collars, however, is made uniform so that they all will fit in the same outside chuck. With the bearing in position the flange end extends outside of the chuck so that this can be finished off accurately by the same boring bar.

New Equipment Available

Light-Weight Paint Spray

SO AS to make the operation of spraying paint as easy and simple as possible, the Alexander Milburn Company, Baltimore, Md., has just brought out a light-weight, compact and extremely efficient paint spray equipment. Particular attention has been given in the design of this to provide simple construction without moving parts and passages

made of forged bronze. The handle is of a special composition fiber.

In operation the paint enters a large annular chamber surrounding the air nozzle, from which it is atomized and expanded in a venturi shape. Atomization is regulated by turning the nozzle. Adjustment provides for a large spray or for entirely shutting off. With the paint shut off the equipment can be used to provide a stream of air for dusting and cleaning purposes. The manufacturers recommend an air pressure of approximately 40 lb.

To test the efficiency of this particular type of spray a large railway system used it for painting cars. Eleven coats of paint were applied and each coat was rubbed down before applying another. It was found that the Milburn spray produced a saving of 75 per cent in time and provided for a reduction in labor of three men.

Large Size Portable Vacuum Cleaner

REPRESENTING a distinct improvement over previous models, a new portable vacuum cleaner, for heavy service such as is needed by electric railways, has been placed on the market by Allen & Billmyre Company, Inc., New York, N. Y. The machine weighs approximately 105 lb. and through use of rubber-tired wheels it can be moved about with exceptional ease. By means of a 15-ft. or 25-ft. length of hose a large surface can be cleaned without constantly moving the machine. It can be used with the same ease as the

ordinary household vacuum cleaner.

The frame of the machine is similar in construction to an automobile chassis except that it stands in a vertical position. It is made in one piece and is mounted on easy running ball bearing wheels which transport the cleaner with very little physical effort. All parts fastened to the frame are welded to assure strength and rigidity and also to avoid vibration.

The exhaustor and $\frac{1}{2}$ -hp. Westinghouse motor are made in a compact, self-contained unit of aluminum construction. This electrically driven device is efficient and is entirely free from wearing parts and there is only one working part, i.e., the steel shaft on which the armature and aluminum impellers are mounted. This shaft operates in ball bearings, which lengthens the life of the machine. Its operation is similar to other vacuum cleaners on the market, except that the air is filtered very thoroughly before it is again set free. The air suction produced by the two-stage centrifugal exhaustor, with its one-piece aluminum impellers, draws the dust and dirt into a container which holds approximately one peck. The cloth filter is held at a distance of 1 in. from the metal container by means of a mesh screen and the entire design of the unit is unusually simple and foolproof.



New Self-Contained Type of Paint Spray

shaped so that clogging will not result. The equipment consists of a rugged cover, body, atomizer and a convenient handle. The illustration shown is for the company's type A, which weighs approximately 1 lb. with a pint container and 17 oz. with a quart container. The body, cap and container are made of aluminum and the atomizing chamber and tip are



Portable Vacuum Cleaner for Heavy Service

This machine can be operated from a lamp socket or floor plug connection. The Westinghouse motor with which the machine is equipped can be operated on direct current of 100 to 120 volts or on alternating current of 105 to 120 volts, 25 to 60 cycles, single phase. Machines can also be supplied for 220 volts.

Association News & Discussions

Central Electric Railway Association Contributes Valuable Ideas

Principles of Taxation, Getting New Business and Reduction of
Costs Among Outstanding Addresses Made on the
Voyage of the "South American"

HARDLY a more delightful mixture of pleasure and gainful effort has been experienced in any recent railway meeting than on the boat trip of the Central Electric Railway Association. From Monday, June 28, until Friday, July 2, the good ship *South American* carried its 300-odd delegates and guests over the Great Lakes. Two stops were made for golf and sightseeing, and bridge and deck games were continually in progress.

Three business sessions were held aboard ship. Ralph Emerson, general manager Cleveland Railway, presented a paper in which he interpreted the recent "shoppers' check" made in Cleveland into facts of value to the industry at large. As stated in the paper, which is abstracted elsewhere in this issue, only one customer in five rides to shop in his or her own conveyance.

Captain Leslie Vickers, economist of the American Electric Railway Association, told of the advanced thinking concerning railway taxation. He showed the futility and injustice of the ad valorem tax now so common. Captain Vickers believes in the tax on gross and net revenue. He cited authorities of national reputation who also approve this basis. His paper is abstracted in this issue.

DEVELOPING OFF-PEAK BUSINESS IN CINCINNATI

Development of off-peak business was considered in a paper prepared by Walter Draper, president Cincinnati Street Railway, but in Mr. Draper's absence the paper was read by H. R. Biery, director of public relations. Mr. Draper contended that buses must be held down to legal speed and electric cars accelerated to legal speed if conditions are to be improved. In his opinion, if only a little change is effected in this situation the improvement will be noticeable and far reaching. Special fares during different periods of the day have not been found workable in Cincinnati, he said. Off-peak riding has been developed by advertising events that may be seen during the non-rush hours. On one occasion 100,000 people were hauled in the off-peak hours of a single day. Special car business, once an important element of the service, has now disappeared. However, this class of business has fallen to the company's buses.

A prepared discussion was presented by Clinton D. Smith, general manager Beaver Valley Traction Company. Mr.

Smith's experience with the zone fares and with different combinations of weekly passes has been extensive. Destination checks formerly were used, but now since their elimination various investigations have failed to reveal any abuse of the system, whereas many advantages have accrued to the company, such as increased speed of operation and savings due to the elimination of checks. The 5-cent zone appears to be uneconomic and consideration is being given to increasing this base fare, he said. Replies to some 300 letters sent out to merchants in the Beaver Valley indicate their desire to see the Beaver Valley Traction Company on a paying basis, as they believe the cars to be a substantial asset to the industries the company serves.

J. W. Welsh, executive secretary A.E.R.A., pinch hit for D. L. Gaskill, secretary-treasurer for the East Central Division of the N.E.L.A. in reading his paper. Mass consideration of industry problems of public policy and personnel was of greatest importance, he said. The amount of good to be obtained from participation in an association depends upon the spirit brought to it.

REDUCED INSURANCE RATES POSSIBLE

Cause and prevention of electric railway fires was the subject of a paper by J. S. Mahan, president Western Section of the International Association of Electrical Inspectors. One reason that rates are high is that the railways carry the best risks and pass the poorest on to the insurance companies. Mr. Mahan analyzed several disastrous fires on railway properties and showed the elements that had contributed to their starting, the conditions which existed and specific fires on traction properties which had come within his observations, though omitting names.

The first was of a carhouse with no division walls and entrance from one end only and with a light metal roof. The fire probably came from a stroke of lightning and the spread of the fire was so rapid that the employees in the carhouse were unable even to save their own clothes. The roof buckled under the heat, resulting in the loss of about 90 cars. Investigation showed that the protection from lightning was not adequate and that the trolley poles had been placed in contact with the trolley wires, preparatory to the early morning runs out of the carhouse. This probably contributed to the rapid spread of the fire by providing numer-

ous paths for the flow of the lightning surge to the earth. The carhouse replacing the one destroyed is of much better construction from a fire underwriter's standpoint. It is divided into sections of not more than three tracks per section, and all openings and walls between these sections are protected on both sides by automatic fire doors. Special hazards, such as carpenter, blacksmith, paint shops, etc., are segregated each in a separate section, and A.D.T. and private watchman clock systems have been installed. All car heaters also have been gone over so as to make them comply with the Fire Underwriters' standard.

In another instance cited by the speaker, smoke was seen coming from a stored car by the night watchman, but he was slow in turning in the alarm. The fire spread rapidly, and soon an exposed metal truss supporting the gable at one end of the carhouse buckled and came down with the brick gable across the entrance. This prevented the removal of cars. By prompt work, aided by the fact that the carhouse was divided into bays with fire doors at the openings, the fire was confined to the section in which it started. It is believed that this fire started from a defective heater. The heater blower motor stalled and became overheated, causing air circulation to be shut off.

In another case cited by the speaker, the carhouse was of good construction, but the water for the fire hose connections was furnished by a tank which was inadequate in size. Had the water supply been adequate, a fire which developed could easily have been confined to the immediate vicinity of its origin.

Another case was cited of a company which carried its own insurance on a power plant, in which oil switches were in a lean-to outside the main building, but communicating with it through a small opening. The fire started in this lean-to, and before it was extinguished there was a loss of more than \$100,000. This more than wiped out the company's insurance fund.

Mr. Mahan quoted instances of material reduction in insurance rates through the installation of changes recommended by the Underwriters' Inspection Bureau, the annual saving in insurance cost being in some cases more than 50 per cent of the cost of installing the improvements.

In closing, Mr. Mahan summarized briefly some of the outstanding things which can be done on every property to reduce the fire risk and thus the fire loss, and spoke particularly of the need of standardized heaters according to the Underwriters' requirements.

BUSINESS PRINCIPLES APPLIED TO SELLING TRANSPORTATION

John Dewhurst, associate editor of *ELECTRIC RAILWAY JOURNAL*, read a paper in which he drew a comparison between riding on electric cars and

buses and the popular sales of other commodities. He pointed out that a basic marketing law indicates that 60 per cent of the product will be sold at the popular price. This popular price is the lowest price for the quality that meets the popular idea of a satisfactory performance. Qualities above this standard, selling up to 25 per cent above the popular price, have a demand amounting to only 30 per cent of the total quantity. For qualities below the standard there is a demand for only 10 per cent of the total volume.

Referring to the market for passenger-miles, he stated that it appears that common carrier cars and buses are now supplying only 28 to 40 per cent of the total market. The theory advanced by Mr. Dewhurst is that the economic carriers, cars and buses, are supplying a service just a little below the popular idea of a satisfactory service today and hence cannot obtain the 60 per cent of the business to which these carriers are rightfully entitled. Almost overnight, he said, the industry has been changed from a monopoly to a highly competitive industry with an improved commodity as a serious competitor. Elimination of noise and increased speed, coupled with modern methods of operation, are necessary hurdles to be jumped before the proper volume of business can be gained. The vehicle is the most important element of modernization. The car of tomorrow must embrace more modern features. Such a vehicle must be built for better service, not necessarily for economies of operation, although that may go hand in hand with other improvements. The light-weight car is an example of combining features of economy and better business getting. A modern vehicle, coupled with operating methods designed to get business, will put the electric railway in position to go ahead and produce.

MAINTENANCE AS A MEANS OF SELLING SERVICE

Maintenance as related to selling service was discussed by Jonathan Wolfe, assistant superintendent of tracks and roadway Chicago Surface Lines, and M. W. Cooke, superintendent of current control Pittsburgh Railways. Mr. Wolfe told of the 100 new cars just purchased by his company and the extensive reconstruction of tracks in the city streets of Chicago in the face of an expiring franchise. Many blocks of track are being reconstructed, using 130-lb. rail with yellow pine ties on either 6-in. concrete or 8-in. rolled stone base. Manganese welding of low joints properly ground off is bringing back much worn track into good condition. High carbon steel is also extensively used. Every complaint of poor track reported by outsiders or company men is noted in a track ledger and a complete record is kept until the trouble is corrected. Mr. Cooke showed graphically the progress his company has made in reducing trolley breaks and at the same time reducing maintenance costs. Life of trolley ears has been taken as a gage to measure life of other trolley equipment.

Many good and bad examples of advertising cards were shown by Labert

St. Clair in his talk on advertising for traffic. Mr. St. Clair warned against the so-called "clever" or "trickily worded" sign as being dangerous. The best signs, he said, are basic truths stated in not more than five words. Policy, performance and publicity define the program of a company entering an advertising campaign. The best mediums to use are, in their relative order of merit, the company publications, newspapers, billboards, movies and general advertising.

Harry Brown, secretary Ohio Brass Company, read H. M. Lytle's paper telling of how the employees of the Chicago, North Shore & Milwaukee sell transportation. An abstract appears elsewhere.

USING THE BUS TO DEVELOP EXCURSION BUSINESS

Buses as used to develop excursion business was the subject of a talk by L. H. Palmer, vice-president Fifth Avenue Coach Company. Mr. Palmer's experience along the lines of his talk was gained largely during his connection with the United Railway & Electric Company of Baltimore. In Baltimore a sightseeing business was established more than a year ago. In Mr. Palmer's opinion the electric railway company of a community should be the purveyor of all transportation except that provided by steam roads.

Operations of the Kentucky Carriers, Inc., a bus subsidiary of the Louisville Railways and operating seventeen city-type buses, were described by G. B. Powell, general manager. Mr. Powell started a bus excursion business last year and up to June of this year had run 2,000 miles at an average gross of 51 cents per

mile. Some 4,000 miles was scheduled for June at an estimated gross averaging 49½ cents. The popular charge for sightseeing tours is a flat charge including incidental costs. Long tours should include in the total meals and rooms at the best hotels.

New York Railroad Club Has Enjoyable Outing

"BACK TO BOYHOOD" was the slogan of the large gathering of steam and electric railway officials, employees and supply men of the New York district who congregated at Travers Island, July 8, for the annual outing of the New York Railroad Club. Golf, baseball, tennis, quoits, together with track and swimming events, were among the sports indulged in. Those who played golf went out early in the morning and played at the Wing Foot Golf Club at Mamaroneck until noon. A special train which conveyed about five hundred more left Grand Central Station, New York, at noon. On arrival at Travers Island a buffet lunch was served, after which the athletic events began. The Sunrise Trail Band of the Long Island Railroad furnished inspiring airs for the would-be athletes. An informal dinner at night concluded the merrymaking.

Strike conditions on the Interborough subway in New York kept a number of the electric railway men away from the festivities, but many employees of nearby electric railway lines which were not affected by the railway strike were well represented. The Long Island Railroad had a large delegation and its athletes carried off most of the prizes in the track and field events.

How Employees Can Sell Transportation*

North Shore Line Employees Conduct Successful Campaign for More Business—Prizes by Company Stimulate Efforts—Central Sales Committee Directs Drive

BY H. M. LYTLE

Vice-President Chicago, North Shore & Milwaukee Railroad

PROBABLY the first requisite to having "employees sell transportation" is to ask them to do it. That may seem rather patent, but the fact is that very few transportation companies have talked to their employees about it. On the other hand, it is unfair merely to ask them to sell transportation without giving them a concrete idea of what you have in mind, or not to have a selling organization to tie to. Setting up such an organization is not as difficult as where the employees are asked to take part in a customer-ownership campaign of a company's securities.

Since Jan. 1, 1926, the men and women who make up the family of the Chicago, North Shore & Milwaukee Railroad—the North Shore Line—have been engaged in an organized "Better Business" campaign. Britton I. Budd, president of the North Shore Line, had been considering asking the employees to sell service

in a definite way for some time, and on that date named a general committee, composed of Jesse S. Hyatt, general manager; M. J. Feron, general superintendent of transportation, and F. W. Shappert, traffic manager, with C. Edward Thorney, an expert traffic man, as secretary. In his letter Mr. Budd said: "It is my hope that every man and woman associated with the North Shore Line shall be enlisted in this campaign. It is my belief that it will prove one of the most popular and beneficial efforts that has been attempted by the North Shore Line." Then, to make the campaign interesting, he authorized awards to total \$5,000 for those making the best selling records during the year.

RESULTS OF FIVE MONTHS' EFFORT

To digress from a connected story of just how the campaign was organized, it may be interesting to note a number of results of the first five months of effort, as follows:

More than 4,500 new business tips touching every phase of the transpor-

*Abstract of paper at summer meeting of Central Electric Railway Association, SS. South American, June 28-July 2, 1926.

tation which the company has to offer were turned in by men and women of the company. In order to sell the road, it has been necessary for every employee further to sell himself; in other words, he has had to become possessed of the fullest information.

While the best of team work has always prevailed among the North Shore Line family, nevertheless the teaming together in hot competition has further developed this spirit of co-operation and good fellowship.

There is a fuller understanding of the railroad's problems than at any time in its history.

The families of all employees on the railroad are interested in the campaign and have heard so much about the road's affairs that members can talk about it almost as fluently as those who are directly on the payroll.

The 11,000 stockholders have been kept advised monthly through a publication which they receive and have been valuable business getters.

Practically all business men in every community served by the railroad know about the road's activity. It has greatly increased their estimate of the company as a live, up-to-the-minute, business-getting organization—one with which they like to deal.

Primarily, the campaign develops two classes of business: one, that which the employees themselves can handle directly, and the other, "leads" which the traffic department experts can follow up. Combined, the two mean an intensive combing of the territory.

The question that is always asked is, "Is the interest of the employees sustained?" The answer to that is seen in the figures from month to month, which have shown a consistent growth both in the number of employees actively participating and in the number of tips turned in to headquarters.

ORGANIZING THE SELLING CAMPAIGN

Summarized briefly, the campaign organization was developed through the holding of a meeting by the general committee of about 100 of the liveliest wires in the organization. These were not necessarily department heads or even persons in supervisory capacities. At this meeting the idea was carefully outlined.

These men were those whom it was felt would naturally be the captains and lieutenants of the organization. The general committee then thoroughly canvassed the entire organization and made appointments of captains and lieutenants that constituted a total of seventeen teams, each representing a department or a particular service of the company. Each was given a captain and lieutenant.

Then there were five field agents appointed and they were given supervision over certain numbers of teams. The field agents report directly to the general committee.

The teams were allowed to pick additional lieutenants as were necessary, but were pledged to enroll in their membership every employee on the payroll.

To help in the organization work, a letter was sent out by the general committee to every employee at his or her

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 22—New England Street Railway Club, annual outing, Portland, Me.

July 23-24—Central Electric Railway Accountants' Association, meeting, Drake Hotel, Chicago, Ill.

July 28-30—Electric Railway Association of Equipment Men, Southern Properties, semi-annual meeting, Chattanooga, Tenn.

Aug. 11—Metropolitan Section A.E.R.A., annual outing, Pelham Bay Park, New York.

Aug. 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Michigan.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

home address, outlining just what the campaign was to be. This has since been followed by other letters from the headquarters office and supplemented by frequent letters from the team captains to their team members.

A headquarters organization was formed to look after both the clerical work and also to act as an organizing force to help out the teams.

A credit system was devised whereby each individual obtains a credit for each tip he turns in. This is carefully noted on an individual card in the office files and a credit is also given at the same time to his team. If the tip actually develops business, he is given additional credit and, if it is especially large or important business, possibly two or three credits. These credits will be totaled at the end of the year to determine how the \$5,000 of award money shall be distributed. In this way it gives positive assurance to the individual that he will get full credit for everything that he does.

Following the organization meeting there were other meetings of team captains and lieutenants where the company's situation was carefully gone into and information given as to particular classes of business which the company was anxious to develop. From the start the employees showed a preference for developing merchandise despatch business and it has been necessary to hammer the passenger end of the business.

Each team has a definite quota for each month, based on the number con-

stituting it. A monthly sheet is kept, with a thermometer illustration, and it is posted in all places where employees congregate. This gives them complete, up-to-date information as to where the teams stand and promotes the competitive spirit.

Large space is given each month in the employee publication—the *High Ball*—to the campaign. This gives a great deal of information that can be used in selling, tells of meritorious work by individuals and is a valuable medium for arousing enthusiasm.

LESSONS LEARNED FROM CAMPAIGN

Further backing up the effort, every meeting of employees, whether departmental, safety, A.E.R.A. section or small group gatherings, is spoken to by some one representing the campaign.

A considerable newspaper advertising program has been carried on in the territory, a series of advertisements on "Facts About the Company" being a big feature.

After the campaign had been under way two months some special awards of extra prize money for particularly good effort were given; this is being continued at irregular intervals. The amounts of these special awards are determined by the general committee.

An interesting feature of the effort is that at the end of May seven teams had scored 100 per cent or better of their quotas; this in spite of the fact that the marks were set very high. It is interesting, too, that the leaders were the teams constituting the baggage department, trainmen on the Waukegan city lines, the freight men in the merchandise despatch department, trainmen on the Milwaukee city lines, the station agents and the motor coach men, which includes the drivers.

These conclusions are apparent in answering the question raised by the title of this paper:

1. If the management is wholeheartedly behind the selling campaign and transmits its enthusiasm down through the organization, then the employees will be the most valuable of all selling agencies at the company's command, for the employees are "the company."

2. There is need of expert direction. A traffic expert, just as skilled at his job as is the construction engineer at his, should direct the campaign. That does not mean a "theoretical expert," but one who has had real transportation salesmanship experience.

3. Before the employees can wholeheartedly sell, they have to be sold on the management, upon their immediate superiors, upon the service they have to sell.

4. If they are sold and actively start selling, it is inevitable that they, because of their collective acquaintance, will bring a vast volume of business to the railroad which it would not obtain in any other way. In addition, they give the company a standing with the public which only a thoroughly "sold" family of employees can bring about.

THE MODUS OPERANDI

Accompanying Mr. Lytle's paper were a number of exhibits of details employed in the active conduct

of the campaign. They included the following:

A blueprint showing the organization of the seventeen different teams, which are arranged in five groups, as follows: (1) Dining and parlor cars, baggage, Chicago station employees, merchandise dispatch. (2) Maintenance of way, construction, transportation, mechanical. (3) Architectural, motor coach, general office. (4) Through service, new industries, Milwaukee city lines. (5) Electrical, Waukegan city, station agents. Each of these groups had a field agent, reporting through the general sales committee to the sales director, Mr. Lytle.

A thermometer chart showing the monthly standing of the seventeen teams mentioned above. These charts are posted in all places where employees congregate. At the side of the chart is a drawing of a thermometer giving the average of all of the teams, and adjoining it are seventeen columns showing the record to date of the individual teams.

Copy of a letter sent to the home of each employee on Jan. 1, 1926, outlining the plan of the better business campaign. It was signed by the general sales committee, gives particulars of new improvements made by the com-

pany as reasons why a better business campaign should succeed at the present time and tells of the offer by President Budd of \$5,000 as prizes.

A later circular sent to all employees describing the organization of the different teams, with the explanation that each individual should also try to make a record for himself. This circular described the method of awarding credits by saying a card index would be kept for each individual of the new business "tips" which were received from him.

Another circular giving talking points about the service, and a questionnaire sent out by field agents to all members of the team under his direction.

Three "pep" type of letters about the campaign sent by the secretary to all employees. One of these explained that the results of the campaign were so gratifying that President Budd had authorized a number of additional awards to individuals for special service in addition to the \$5,000 previously announced. The names of those receiving such prizes are given.

Copies of the company's publication, the *High Ball*, showing how extensively the campaign was featured in that magazine, which goes to the homes of all employees.

pay; for our ability to pay measures accurately the value of the franchise that has been granted to us, whether it remains a complete monopoly or a broken monopoly under the influence of the multitude of private automobiles that do the work which we once performed.

METHODS OF TAXING PUBLIC UTILITIES WERE STUDIED

Now, what are the methods in use today for taxing public utilities? At the suggestion of Mr. Storrs and the Advisory Council, I undertook a year ago to study the taxation burden of thirteen selected electric railway companies and to find, if I could, the underlying principle upon which their taxes were levied. I was able to determine the burden of their taxes all right, but when I came to determining the principle that underlay that burden I met with nothing but failure, and the reason for this is that there is no underlying principle.

In order to be brief and avoid boring you with figures, let me say that there are two main methods in use. One that is used very seldom is the capitalization method, but this one is so fully discredited that I shall not take time to discuss it. Most of the states follow the ad valorem method, under which an attempt is made to tax the utility according to the same principles that guide assessors in arriving at the value of other properties such as real estate. But experience has shown that under regulation you cannot determine the value of a utility as you can that of other economic property that is not regulated, and the ad valorem method has broken down in almost all those cases where the earnings of the utility have not been given major weight in the determination of value.

Furthermore, in states such as Ohio, where the law demands that property be assessed at 100 per cent of its value, it has become a notorious fact that local assessors willfully ignore this provision of the statute in regard to general property and enforce it in regard to public utilities. The result of this has been that in Ohio many examples exist of whole counties taxed on an assessment of 40 to 50 per cent of the value of general property, while the public utilities in the same counties have been carrying a tax of a full 100 per cent of their value. But then, corporations have no vote, while general property owners have.

EARNINGS THE REAL BASIS FOR TAXATION

Now if, under the ad valorem system of taxation, it has been found necessary to give the greatest weight to earnings, why not frankly admit that earnings furnish the real basis of taxation for a utility? Why bother about capitalization and valuation when in earnings you have a simple, efficient and accurate measure both of tax-paying ability and for obligation to the body which grants the franchise? Senator Davenport's committee of the National Tax Association summed it up when he said: "The ad valorem basis lacks simplicity. It is apt to become arbitrary, its administration is difficult and expensive. It is not an accurate measure

Relief of Taxation and Imposts—A Hopeful Outlook*

Readjustment of Burdens According to Ability to Pay Will Bring the Utilities in Line with Other Business—Combined Gross and Net Tax Urged as Most Equitable

BY LESLIE VICKERS

Economist American Electric Railway Association, New York City

RELIEF from taxation and imposts are the two directions at the present time toward which we can look hopefully for help. We have gone a considerable distance in fare increases, and in some cases have reached the barrier beyond which we dare not go for fear of discouraging car riding; we have just put into effect every economy of management that we could think of. We have done much to reduce our wage cost by the introduction of one-man cars, and by the use of bigger cars have reduced costs of operation and upkeep costs. But in the matter of taxation and imposts we have frequently found ourselves helpless in the presence of taxing bodies who were relentless in their determination to get out of us the last cent they could. It was not so bad when we enjoyed a monopoly and could pass the increased cost on to the car rider. It was up to him to pay us, as he would any other collector; and while he did not always stop to think that the fare he paid for his ride was a real tax and was passed on to some governing body, yet he paid just the same because he had to. Then came the private automobile and the greatest revolution in transportation history.

I have really no quarrel with regulation. I believe it has come to stay and

IT IS quite certain that a gross earnings tax alone will never remove inequalities and injustices. But a combination of the two methods—gross earnings and net earnings—will come as close as any tax that has ever been devised toward producing equalities among the utilities themselves and toward bringing them into line with the taxes that ordinary unregulated businesses have to pay. Besides it will bring to the state a more definite income yearly with which to meet the expenses outlined in its budget, and thus avoid the criticism that the utility is escaping taxation because it is badly managed.

is in the best interests of the public. But what I would plead for today is a recognition by the public of the injustice of imposing twentieth century regulations on the same industry that has to put up with our eighteenth century system of taxation. In a word, I am pleading for the recognition of the principles that the only fair and just method of taxing a regulated industry is according to its ability to

*Abstract of paper at summer meeting of Central Electric Railway Association, SS. *South American*, en route Buffalo to Chicago, June 28-July 2, 1926.

of the obligation or ability to pay taxes. It does not succeed in placing a burden of taxes equitably.

"The tax on earnings is strong at the points where the ad valorem basis is weak. The earnings of a corporation are the real basis of its work and its tax-paying ability. The earnings tax involves the fewest theoretical conditions and is simple and inexpensive to administer. Earnings are a matter of fact about which there will generally not be disagreement. The determination of net earnings does involve certain valuations, but in general the element of personal judgment is relatively small as compared with the property tax. The earnings tax is simple and clear. It usually fluctuates with the prosperity of the tax-paying corporations and it is generally equitable between corporations."

While most of us feel that we are

I HAVE really no quarrel with regulation. I believe it has come to stay and is in the best interests of the public. But what I would plead for today is a recognition by the public of the injustice of imposing twentieth century regulations on the same industry that has to put up with our eighteenth century system of taxation. In a word, I am pleading for the recognition of the principles that the only fair and just method of taxing a regulated industry is according to its ability to pay, for our ability to pay measures accurately the value of the franchise that has been granted to us, whether it remains a complete monopoly or a broken monopoly under the influence of the multitudes of private automobiles that do the work which we once performed.

suffering under burdensome and discriminatory taxes, few of us realize just how heavy and unequal those burdens are. Again, with a desire to avoid figures and details as much as possible, let me simply state that in this investigation which we made we found that local taxes varied all the way from 1½ to nearly 10 per cent of the gross; state taxes varied all the way from nothing to 6½ per cent of the gross, while federal taxes in so far as they represent profits are almost negligible. Or, take another comparison. It was shown that in 1923 business corporations generally, including transportation companies, paid out a little more than 2 cents on every dollar they took in, for taxes. This group of electric railways paid out 7.7 cents; but of their net income before taxes corporations generally surrendered 27½ per cent, while these electric railways paid out 63.59 in taxes and an additional amount in inescapable imposts. And, while corporations generally paid taxes to the extent of 38 per cent of their corporate net income, these street railways were burdened with a tax amounting to

almost 200 per cent and a burden of taxes and imposts combined of 265 per cent. As a matter of fact, they are better off than the electric railway companies generally throughout the country, for an investigation of their situation discloses the fact that in 1924 the relation of their taxes, corporate income or net after taxes was 343 per cent.

It is fair to assume that we have now reached the point in our political as well as our business life where we realize that the fairest basis of any taxation is that which applies the principle of ability to pay. The public utilities have never so far been taxed under this principle, for they have been regarded as tax gatherers supplying the government with an easy and effective method of providing the money called for by their budgets. The group of people which utilities serve are usually scattered over wide areas and are for the most part unable to make their voices heard in protest. It is only when the bondholders of the utilities are affected that real action is taken and an effort made to get rid of burdens which fall not only on them but upon the consuming public as well. Equality of taxation is guaranteed by the constitution of almost every state. Equality by no means is to be considered as "the same amount." It means equality of burden, and the burden can only be estimated by ability. Therefore, an ad valorem tax, unless based exclusively upon the item of earnings—in which case it ceases to be a true ad valorem tax—can never provide a satisfactory basis for ability to pay. The main point in regard to taxation from a historical point of view is that despite the fact that complete regulation has characterized the industry for a number of years and that it has been singled out from ordinary businesses and not allowed to make that economic profit which is the reason for their existence, little or no effort has been made to readjust taxes in accordance with the changed conditions. The fact is that our legal and regulatory procedure has advanced much more rapidly than our tax procedure, and that the willingness of the body politic to impose restrictive and regulatory legislation upon the industry has not been matched by willingness to adjust the tax method conforming to this new principle.

OLD-FASHIONED TAXATION METHODS STILL PERSIST

The result of this has been that in many places the old-fashioned method of taxation by local assessors of little bits of the public utility system still persists; that state commissions and assessors usually look upon public utilities as the ones that will readily serve their purpose for gathering in those taxes which the legislature has made up its mind that it is going to spend; and that the great voiceless throng, made up for the most part of people of scant or moderate means, has quietly had to submit to a heavy burden of taxation. This might not be so bad were it not for the fact that the rights of capital, honestly invested, to earn a fair return have been almost totally ignored, and while many companies have been liberally taxed into bank-

ruptcy many more have been kept on the ragged edge of poverty—a condition which has prevented them from maintaining their self-respect and giving to the public that form of service to which it is entitled.

The joint committee on taxation and retrenchment of the state of New York did not exaggerate when it said that the system of taxation in that state was the despair of every student of the subject. Every study of taxation that is made points out the great inequalities of tax burden, not only between the various groups of industries, but also among the public utilities themselves.

Almost all the blame can be laid at the door of two groups: (1) the local tax officials, who are greedy for everything they can get out of the public utility; and (2) at the door of the state taxing authorities, who still adhere in

IT IS fair to assume that we have now reached the point in our political as well as our business life where we realize that the fairest basis of any taxation is that which applies the principle of ability to pay. The public utilities have never so far been taxed under this principle, for they have been regarded as tax gatherers supplying the government with an easy and effective method of providing the money called for by their budgets. The group of people which utilities serve are usually scattered over wide areas and are for the most part unable to make their voices heard in protest. It is only when the bondholders of the utilities are affected that real action is taken and an effort made to get rid of burdens which fall not only on them but upon the consuming public as well.

most cases to the time-worn and out-of-date ad valorem system of taxation.

Quite a good case could be established by the argument that since public utility property is devoted entirely to public use, it should therefore escape taxation to the same degree as a court house or capitol building; but, as far as I know, there is no one within the industry and few outsiders who advocate such an exemption. I do not know of any subject upon which there is a greater unanimity of opinion among tax experts and economists than that of what constitutes the proper basis for the taxation of public utilities. A long list of experts might be quoted in favor of the contention that they should be taxed exactly according to their earnings.

Under the condition of regulation to which public utilities now are almost entirely subject, the object or purpose of public utility tax should be to supplement rate regulation and bring to the state as much as possible of those profits that arise through favorable franchise arrangements; but where the

franchise arrangements are unfavorable, due in part to the state and its regulation, the state cannot in fairness expect to gain in the form of taxes.

GROSS OR NET EARNINGS?

Now if we admit that earnings constitute the basis of just taxation for utilities—and I do not imagine there will be many dissenting voices in this group at least—then how are earnings to be measured? Is it to be gross earnings or net earnings? It is admitted that "net" earnings is the ideal base from a utility point of view, but it should not be forgotten that every company which enjoys the protection of the state, whether profitable or unprofitable, owes something to the state under which it operates its franchise. It might also be argued that the larger the company the more it should pay and that its size is fairly represented by its gross earnings. But gross earnings by themselves can be fully as unjust as the ad valorem method; for a utility, due to the conditions under which it has to operate, may have an enormous gross and no net, while another utility alongside it may have a small gross and a high proportion of net.

It is quite certain that a gross earnings tax alone will never remove inequalities and injustices. But a combination of the two methods—gross earnings and net earnings—will come as close as any tax that has ever been devised toward producing equalities among the utilities themselves and toward bringing them into line with the taxes that ordinary unregulated businesses have to pay. Besides, it will bring to the state a more definite income yearly with which to meet the expenses outlined in its budget, and thus avoid the criticism that the utility is escaping taxation because it is badly managed.

What is the gross-net tax? It is *not* a new idea nor a new method. It is not the wild dream of an unknown and unimportant economist, but the definite recommendation of the most thoroughgoing and expert committee that has ever been brought together to consider taxes—the special committee on taxation and retrenchment of the state of New York which reported in 1922. It is the recommended method of the National Tax Association, which comprises almost all the foremost tax experts and commissioners throughout the country. It is the method that has the approval of such international figures as Professor Seligman of Columbia University, Professor Fairchild of Yale and Professor Bulloch of Harvard. In fact, I do not know of any single prominent economist or tax expert that has had a word to say against it—and yet it has never been adopted by a single state in the Union.

What the gross-net tax proposes to do is this: To tax all public utility corporations according to their gross in relation to their net earnings, the gross earnings being defined as "all receipts from the operation of a public utility," and net earnings being defined as "net earnings from the operation of a public utility after deductions of operating expenses and taxes assignable to operation except the gross-net

tax itself." It is hoped, of course, that the gross-net tax will be the *only* tax imposed and that by a system of reapportionment to the individual communities, every other tax and impost burden will be removed as unnecessary and unjust.

No definite schedule could be laid down for all the states, since their budget requirements differ so widely. But for the state of New York, in order to bring in to the treasury almost the same amount of money as was being paid by the utilities under the multitude of taxes that affect operators, the following schedule was suggested:

Every company shall pay an annual tax that shall be the percentage of gross earnings fixed herein:

1. When it has no net earnings or its net earnings do not exceed 5 per cent of its gross earnings—1 per cent.

WHAT the gross-net tax proposes to do is this, to tax all public utility corporations according to their gross in relation to their net earnings, the gross earnings being defined as "all receipts from the operation of a public utility" and net earnings being defined as "net earnings from the operation of a public utility after deductions of operating expenses and taxes assignable to operation except the gross-net tax itself." It is hoped, of course, that the gross-net tax will be the *only* tax imposed, and that by a system of reapportionment to the individual communities every other tax and impost burden will be removed as unnecessary and unjust.

2. When its net earnings exceed 5 per cent of its gross earnings but do not exceed 10 per cent—1½ per cent.

3. When its net earnings exceed 10 per cent of its gross earnings but do not exceed 15 per cent—1¾ per cent.

4. When its net earnings exceed 15 per cent of its gross earnings but do not exceed 20 per cent—2 per cent.

5. When its net earnings exceed 20 per cent of its gross earnings but do not exceed 25 per cent—2½ per cent.

6. When its net earnings exceed 25 per cent of its gross earnings but do not exceed 30 per cent—2¾ per cent.

7. When its net earnings exceed 30 per cent of its gross earnings but do not exceed 35 per cent—3 per cent.

8. When its net earnings exceed 35 per cent of its gross earnings but do not exceed 40 per cent—3½ per cent.

9. When its net earnings exceed 40 per cent of its gross earnings—3 per cent.

I have recently had the pleasure of working with a committee of the Wisconsin Utilities Association and drew up for it a schedule which calls for a tax of 1 per cent on corporations having no net or a net of less than 5 per cent of their gross and ranging up to 7 per cent of the gross in the case of those utilities whose net was in excess of 40 per cent of their gross. No one can complain that this is a light tax. Indeed, if the manufacturers of Wisconsin were to be taxed in the same principle as we are proposing for the public utilities there, they would have to shoulder a burden 30 per cent heavier than they carry today, and I

believe that we would find that something like the same conditions exist in almost all states.

It is not hoped that the introduction of the gross-net tax will immediately relieve the public utilities of the burden under which they operate. In my opinion, it would probably be a mistake in judgment to suggest a change in the method of tax and in the amount of taxation at the same time. It would be far better for the utilities to agree to pay as a whole for the coming year that amount of taxation which would be imposed upon them under the ad valorem method, or perhaps the same amount as in the previous year for the industry as a whole. Then using the figures which we have obtained and apportioning a gross-net tax on the basis of these figures, it will be apparent to the commission and ultimately to the Legislature and the people they represent that the public utilities are paying a heavy proportion of their net in taxes. When this is fully realized, it will be opportune to ask for a reduction in the interests of equalization of the tax burdens of those who go up to make the state.

TAXES READJUSTED

The gross-net tax will undoubtedly change the amount of taxes paid by the various utilities, some getting relief and others being more heavily burdened. This condition will have to be faced by the industry as a whole, and my hope is that it can be borne for a year, in view of the possible lightening of burden which we can hope for the industry as a whole at the end of that time.

The advantage of simplicity and ease of operation and application of the gross-net tax by the tax commission must not be lost sight of. It would make the administration of the tax commission an unusually simple matter as far as the utilities are concerned. It would avoid appeals and disputes which now take up a great deal of the commission's time. It would be fair as between the industries that comprise the public utility group. It would be flexible.

Some opposition will naturally be made to such a measure, since it proposes to tax utilities by a different method than that which applies to ordinary commercial property; but in some states telephone companies are already taxed by a different method and, after all, method must be made subservient to equality. In adopting the earnings factor as the most important one in determining the ad valorem method of taxation, the commissions have already thrown over completely the basis upon which taxation in the past was founded. This they had to do as the only logical step following regulation which so completely altered the economic outlook of public utilities.

I present this idea on taxation of public utilities as the most hopeful avenue of escape that we have from a burden that is rapidly becoming unbearable and which is responsible in large measure for the depletion of electric railway properties throughout the country. We are between the devil and the deep sea—the devil being the regulatory bodies that say how much

we shall take in in revenue, and the deep sea being the taxing authorities that say how much we shall pay out in tribute to them for the privilege of operating a utility.

In our fight for lower and less discriminatory taxes we represent not only the owners of millions of dollars worth of invested funds but the millions of car riders who belong to a class of society that is least able to pay high taxes, for the rich have their own private automobiles and patronize our services but little; whereas the great mass of middle and lower class of people, who have been excluded from the federal income tax burden on the grounds that they are unable to contribute, ride the street cars and pay for the privilege a tax more burdensome than that imposed upon any other industry.

Let us awaken them to a knowledge of the conditions. Let us get the information before them through advertising, through Rotary and Kiwanis Clubs and boards of trade and let us enlist their help toward putting the electric railway industry back where it belongs as the cheapest, safest and cleanest and most efficient method of street transportation.

International Congress Announces Program

PLANs for the twentieth congress of the International Tramway, Local Railway and Motorbus Association have been sent out by President Fr. de Lancker and General Secretary A. de Backer. The congress will be held on Oct. 10-15 inclusive at Barcelona, Spain. Following is the provisional program as announced:

Sunday, Oct. 10

Registration and announcements.
10:30 p.m.—Reception to delegates.

Monday, Oct. 11

10:30 a.m.—Opening session; address of welcome; first technical session.
1 p.m.—Luncheon as guests of the Marquis of Foronda, president of the local executive committee of the association.
5 p.m.—Second Session.

Tuesday, Oct. 12

10 a.m.—Third Session.
3 p.m.—Visit to bull ring.
7 p.m.—Fourth Session.

Wednesday, Oct. 13

10 a.m.—Fifth Session.
1 p.m.—Luncheon as guests of Cataluna Railways.
3:30 p.m.—Visit to Sabadell and Tarrasa, served by the Cataluna Railways.
9 p.m.—Banquet given by his Excellency the Mayor of Barcelona.

Thursday, Oct. 14

Excursion to Montserrat; luncheon given by the Catalan Railway.

Friday, Oct. 15

10 a.m.—Sixth Session, general business meeting; meeting of executive committee.
1 p.m.—Luncheon at Tibidabo, guests of the Barcelona Metropolitan Railways (subway) and Great Metropolitan Railway (suburban railway system), to be followed by visits to the shops of these companies.
8:30 p.m.—Banquet, guests of Barcelona Tramways; closing of congress.

On Saturday morning those who desire can leave for Madrid, where the delegates will be guests of the Madrid Tramways. Sunday will be devoted to sightseeing trips in Madrid. Monday an excursion to Toledo is planned, and Tuesday will be devoted to an inspection

of the Madrid Tramway System and shops.

In connection with the congress, a program of entertainment has been arranged for the ladies.

F. L. Blanchard Heads Utility Advertising Association

NEW officers were elected by the Public Utilities Advertising Association during a recent meeting in Philadelphia. As now constituted the personnel of the association is: Pres-

ident, Frank L. Blanchard, Henry L. Doherty Company. Vice - presidents, George F. Oxley, National Electric Light Association; Hal. M. Lytle, Chicago Rapid Transit Company. Secretary, Henry Obermeyer, Consolidated Gas Company of New York. Treasurer, Charles W. Person, American Gas Association.

The association is one of the youngest departmentals of the International Advertising Association, but the public service group reported a membership of more than 300, representing 225 utility companies throughout the country.

Advantages of Electric Drive for Gasoline Buses*

Higher Speeds, More Efficient Utilization of Engine, Less Mechanical Strain and Reduced Maintenance Costs Are Obtained with This Type of Vehicle

BY H. L. ANDREWS

Assistant Engineer Railway Department,
General Electric Company

SEVERAL factors contribute to the ability of the electric drive to maintain higher average speeds than the mechanical drive bus in frequent stop service. Of chief importance is the elimination of the time lost in shifting gears during each acceleration or on grades. An expert driver trying to make a fast schedule with mechanical transmission can shift gears and let the clutch into complete engagement in about 1.5 seconds. The average driver trying to avoid jerking the passengers and clashing gears requires from 2.5 to 3 seconds for each gear shift. On level runs, with four-speed transmission, drivers may start on second gear and thus have three shifts to make on each acceleration, which consumes from 5 to 8 seconds. During the period of changing from one gear to another the engine is not only doing no useful work but there is an actual retardation of bus speed.

To compensate for these sags in the acceleration curves many drivers will operate engines at excessive speeds in second and third gear to obtain high power output from the engine and high tractive effort at the rear wheels. Unless the engine speed is brought to a very high point in third gear the speed when starting on high is so low as seriously to reduce the rate of acceleration. These features are inherent in mechanical transmission where engine speeds and wheel speeds are directly proportional and in each gear position the engine speed and its power must operate over a wide range.

With the automatic electric drive the characteristics of the generator and motors are such that the engine may be quickly increased in speed from idling to a point of high output speed, and then gradually increased to maximum safe output with no intermission or lag. The result is operation at the most efficient part of the speed curve, a more constant power output and a

very appreciably higher rate of acceleration. This higher rate of acceleration permits higher schedule speeds, and experience indicates that under similar operating conditions a bus equipped with electric drive can maintain at least 10 per cent higher schedule speed than a bus equipped with mechanical transmission.

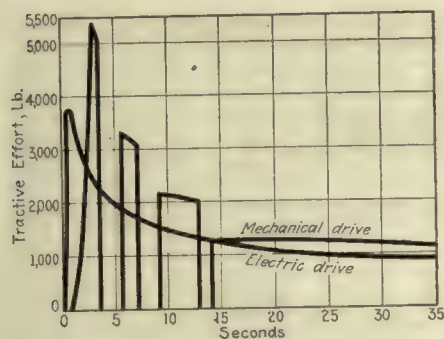
There is little question but that with expert drivers mechanical transmission can accelerate as rapidly as electric transmission, but it is not feasible in normal operation, and even though it were, it is possible that accidents would increase to such an extent that the pace could not be maintained. The Philadelphia Rural Transit Company is operating 235 motor buses with electric drive and maintaining schedule speeds of 11.5 to 12.5 m.p.h., which it is safe to say is materially higher than schedules maintained by mechanical transmission under similar conditions.

In actual service tests with electric drive the maximum engine speeds obtained during acceleration or when climbing severe grades are approximately 1,700 r.p.m., and normally in frequent stop service the maximum speed seldom exceeds 1,500 r.p.m. Similar tests with mechanical drive when attempting to maintain similar schedules show maximum engine speeds of 2,000 to 2,600 r.p.m. in the intermediate gear position.

Or, to put it another way, the electric drive reduces the engine peaks during acceleration approximately 40 per cent. In addition, during the retardation period, the idling and braking period, the engine revolutions with mechanical transmission are directly proportional to the bus speed. With electric drive the engine drops to idling speeds at the beginning of the retardation period and operates at this speed until the bus is again accelerated, when it is quickly brought up to a high output speed.

This feature, together with the lower peak engine speeds during acceleration, means less engine revolutions in a given service.

*Abstract of a paper presented at the semi-annual meeting of the New York Electric Railway Association, Bluff Point, N. Y., June 25.



Comparison of Acceleration with Mechanical and Electric Drives

Tests over an extended period in service with two buses using the same engine in each, exact duplicates in every respect except that one has electric drive and the other mechanical, proved that the engine of the electric drive bus operated at maximum speeds of approximately 1,650 r.p.m., while the same engine with the mechanical drive had to be operated at maximum speeds of 2,600 r.p.m. to perform the same schedules. The engine with the mechanical transmission made from 15 per cent to 22 per cent more revolutions per bus-mile than the same engine with electric drive performing the same work.

Torsional strain during acceleration on the engine, chassis, clutch and gears is recognized as contributing to high maintenance. With electric drive these torque surges are eliminated, which should reduce maintenance costs.

From an engineering viewpoint, compare the sharp surges which occur in every acceleration as the gears are shifted and the clutch engaged with the electric drive which starts off and continues to maximum with a gradually increasing torque without at any time putting a severe strain on any part of the mechanism. Dynamometer tests show that the electric drive cuts the peaks of torsion approximately 60 per cent.

COMPARATIVE FUEL CONSUMPTION

The question which occurs to the average operator is, Do you sacrifice fuel efficiency by the use of electric drive? The over-all efficiency of electric drive is approximately 75 per cent, which is less than mechanical transmission on direct gears, and for this reason it would seem that the fuel efficiency should be less. Results in service show that electric drive does not increase the fuel consumption beyond that required by the additional weight of equipment.

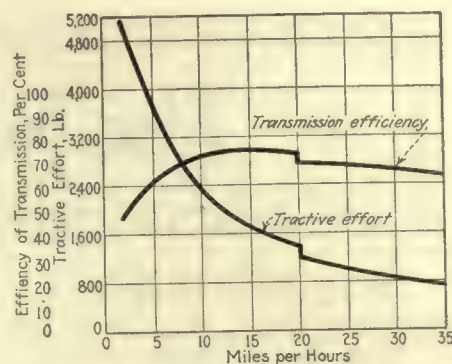
An 11-ton loaded bus equipped with mechanical transmission will operate from 4 to 4.5 miles per gallon of gasoline, or 44 to 50 ton-miles per gallon. The same vehicle equipped with electric drive will weigh approximately 12 tons loaded and will operate 3.5 to 4 miles per gallon of gasoline, or 42 to 48 ton-miles per gallon. This is far less increase in fuel consumption than is caused by the use of a six-cylinder engine instead of a four-cylinder, yet 75 per cent of all buses are today being equipped with six-cylinder machines.

One reason for this is partially the average lower speed of the engine with electric drive and every revolution of

the engine takes a certain amount of gasoline, whether that gasoline is consumed and properly utilized or not. Another reason is that with mechanical drive it is necessary to step up through several long trains of gears which are not very efficient and which limit the engine speed when starting to a period of low thermal efficiency. The fact that with electric drive the engine is not called on to deliver high torque at low engine speed permits the use of higher compressions at normal operating speeds, which increases the power and efficiency.

With electric drive the engine speed rises very rapidly to high output speed and then gradually increases to a maximum of 1,600 to 1,700 r.p.m. All through that cycle the electric drive works through the most efficient part of the engine characteristic.

As a matter of fact, any difference in fuel is relatively unimportant, as fuel costs are about 4½ cents per bus-mile, and any factor which affects fuel consumption 10 per cent will affect costs less than ½ cent per bus-mile. The most important item in costs is crew expense, and as this item is approximately 14½ cents per bus-mile, any factor which affects the schedule speed by 10 per cent affects the costs 1½ cents for crew wages only, and, furthermore, affects the fixed charges in the same ratio, because as schedule speed in-



Speed-tractive Effort Characteristics and Corresponding Efficiencies of Electric Drive

creases the number of buses for the same service decreases.

The period of operation is too short as yet to make available any figures on relative maintenance. However, the Philadelphia Rural Transit Company and the Capitol District Transportation Company have doubled their inspection periods with electric drive and so reduced their garage expense.

After all, the most important point is high schedule speed with smooth acceleration, greater comfort for passengers, quiet operation and greater safety by reason of less manual duty on the part of the operator and better control of the bus.

American Association News

Hotel Reservations at Cleveland

MEMBERS planning to attend the convention of the association next October who have not yet sent in their reservations for accommodations in Cleveland, in accordance with a circular letter of April 27, 1926, of the hotel and housing committee, are advised to do so at the earliest possible moment. All such communications should be addressed to Paul E. Wilson, chairman hotel and housing committee, American Electric Railway Association, 403 Chamber of Commerce Building, Cleveland, Ohio.

Metropolitan Section Prepares to Show Its Form

MEMBERS of the Metropolitan Section are now preparing to go into training for the many athletic events scheduled for the second annual outing. Pelham Bay Park has been selected as the scene of these activities. The date is Aug. 11. First on the program will be the golf tournament, which is scheduled to commence at 9 o'clock in the morning. Details concerning the course, conditions for the tournament, etc., will be announced later by the chairman of the golf committee, E. B. Smith of the American Brake Shoe & Foundry Company.

No general arrangement has been made covering a mid-day meal for the members of the section who go on the outing. It is thought that

those who play golf probably will wish to get lunch at the club where the tournament is held. Others will be expected to bring their own lunches or get them at some neighboring lunchroom.

Athletic events on the program for the afternoon are of varied character. They include:

1. 100-Yard Dash.
2. Fat Men's Race (minimum weight, 220 lb.).
3. Tug of War between Manufacturers and Railway Men. (Each side will endeavor to drag the other through a mud hole or water hazard.)
4. Wheelbarrow Race. (Each contestant will be blindfolded and given a wheelbarrow to be placed as near as possible to some predetermined object, such as a tree, pole, etc.)
5. Boat Race. (Each contestant will row a given distance carrying a passenger in the stern of his boat.)
6. Quoits.
7. Baseball Game between Manufacturers and Railway Men. (It is understood that the railway men have discovered material of a very high order for the battery of their team.)

Activities of the afternoon will be followed by a dinner that is scheduled to start at 6 o'clock. Prizes for the athletic events will be awarded at the dinner.

Members planning to attend this outing are urged to procure their tickets as soon as possible. Each railway company has at least one representative on the ticket committee. Applications should be made to these representatives for whatever tickets are desired. Others may procure tickets from G. H. Ord, chairman; J. F. Craig or C. P. Westlake.

The News of the Industry

Jitney Issue Reopened

Resort Made to Injunctions and Counter Injunctions at Detroit—More Moves Likely

The fate of the jitneys operating in Detroit streets wavered with the closing of the month of June and was not definitely decided even when the Michigan Supreme Court sustained its former decision upholding the validity of the ordinance passed by the Detroit City Council barring the jitneys from the main thoroughfares.

Despite an announcement by the general manager of the Department of Street Railways that it would have 41 motor coaches purchased from the D. U. R. for runs on Jefferson Avenue, Grand River Avenue and Fort Street, and additional cars on Woodward Avenue, with a new skip-stop system to speed up service to care for the regular jitney patrons, Police Commissioner Croul stated that no immediate steps would be taken to drive the jitneys off the streets. The police department, instead, was working out a system of parallel routes for the jitneys. It was intended to ask the Council to revamp the jitney ordinance.

An opinion on the matter asked of the Corporation Counsel's office by Colonel Wallace, general manager of the D. S. R., was to the effect that the Michigan Supreme Court had upheld the validity of the jitney ordinance and that the ordinance should be enforced until amended. On June 30 Mayor Smith ordered that no jitneys be permitted to operate on the main streets of Detroit after that date. The Council refused to consider a resolution to extend the time for enforcement of the ordinance until further order of the Council.

Mayor Smith stated emphatically that the only amendment to which he would agree was one strengthening the ordinance and throwing the jitneys off the streets altogether. It was cited that if the Department of Street Railways is to give the best possible service for the lowest possible fare, it should have a monopoly, and that the fares collected by the jitneys should go to the D. S. R.

The president of the Council expressed the opinion that the best interests of the people cannot be served with several competing transportation systems operating in the streets and that the monopoly should be extended also to include the motor buses. He further stated that the D. S. R. is not the only consideration; safety must also be considered.

Representatives of the jitney drivers argued that it was an unwise move from a civic standpoint arbitrarily to order \$500,000 worth of rolling stock off the streets when transportation facilities are none too plentiful. The

jitney was referred to as the only present means of rapid transit offered to the public of Detroit. The president of one of the drivers' associations declared that the jitneys are not taking a fighting attitude and will not try to run against any official orders, but there is an urgent need for them and they are asking that they be allowed to remain.

A brief attempt was made to enforce the ordinance on July 1, but all attempts were abandoned after 10 a.m., at which hour the police and Corporation Counsel were served with copies of an injunction signed by Circuit Judge Harry J. Dingeman. The injunction restrained the city authorities from interfering with the operation of the jitneys until after a hearing set for July 7. Attempts at enforcement before the writs were served consisted in keeping the vehicles moving in the streets instead of permitting them to stand at their regular loading stations.

The Corporation Counsel's office gave out an opinion that the Circuit Court had no jurisdiction in the case as the validity of the ordinance had been upheld by the Supreme Court. A hearing

was requested within 24 hours, and despite the contention of the Corporation Counsel that the injunction was invalid, Mayor Smith declared that the city would observe the terms of the injunction until such time as it was dissolved.

Legal skirmishes followed in quick succession on July 2, but at the end of the day the jitneys were still running. The Supreme Court handed down a ruling upholding the validity of the ordinance and refused to grant a rehearing of the case as asked by attorneys for the jitney drivers.

In the forenoon of July 2 Judge Murphy dissolved the injunction granted by Judge Harry Dingeman which restrained the city from enforcing the ordinance, and in the afternoon of the same day he granted a temporary restraining order forbidding the police, Mayor Smith and the Sheriff's office from interfering with jitney operations. This later action by Judge Murphy was taken on a "taxpayer's suit" and granted a reprieve until July 7. A public hearing was held by the Council on July 6.

Subway Motormen of Interborough, New York, Strike

Operators and Switchmen Secede from Brotherhood Organization—Contract with Other Men Renewed Recently—Full Statements of Company's Position

Strikers Ask \$1 Hour

MOTORMEN for the Interborough receive from 69 to 82 cents an hour, depending on length of service. The scale for the first year is \$38.64 a week and \$45.92 after six years' service.

Switchmen at present receive from 58 to 61 cents. Their average weekly earnings for the first year are \$32.48. In the third year they receive \$34.16.

The strikers demand \$1 an hour for motormen and 75 cents for switchmen. They and the other Interborough employees work seven days in the week.

NEWSPAPER accounts of the strike of the motormen and switchmen of the Interborough Rapid Transit Company, New York, declared effective at midnight on July 5, make the situation appear much worse than it really is. Service is inadequate, it is true, but the lines are being operated with a degree of skill that is unusual considering the defections from the ranks of the men. These defections totaled

about half the force of workers on the subway division, with a scattering of men from the elevated lines. The company has the situation well in hand, and is gradually building up its personnel to the required quota.

But it is the issues involved that are of real interest. Officials of the Brotherhood of Interborough Rapid Transit Company Employees and of the company signed an agreement on June 30 continuing for a year the wage scale agreement which expired at midnight on June 30. The new agreement covers all 28 locals of the brotherhood. The action was taken at an executive conference attended by 62 representatives of the union and three I.R.T. officials. M. J. Mangan, secretary of the brotherhood, and Frank Hedley, president and general manager of the I.R.T., made the announcement. Prior to the meeting, the majority of the locals were prepared to renew the old agreement, but those representing the motormen and switchmen held out for a wage increase.

There had been rumors before of possible dissension among the motormen and switchmen, but this was the first real indication that the situation might get beyond the point of possible settlement by mediation between the two parties. On July 2 there followed



A Scene During the Subway Strike with New York Policemen Waiting in a Subway Coach at Van Cortlandt Park Station to Go with Strike-Breaking Motormen

an ultimatum that unless their demands were met by 6 o'clock that night, at least 579 motormen and switchmen out of a total of 752 employed on the subway lines would cease work at a minute after midnight Tuesday morning. To the still loyal members of the brotherhood Frank Hedley, president of the Interborough, explained that power never had been vested in the subway motormen and switchmen's union to reject or refuse to be bound by the action of the general committee of the brotherhood. Because he believed the subway motormen and switchmen were being made tools of by a few ambitious men among them desirous of promoting their own ends, he said he was going to give them a reasonable opportunity for second thought. If they persisted in withdrawing from the brotherhood and joined this "outlaw organization," he said, "it will be necessary for me to terminate their employment."

So serious had the prospects now become that the Transit Commission held conferences on Sunday with representatives of both the railway and the motormen. The representatives of the motormen called first. They were Edward P. Lavin, Harry Bark and Joseph Phelan. The delegation informed the commission that they had decided to accept the commission's offer to arbitrate the wage question. Mr. Hedley and James L. Quackenbush, general counsel of the railway, were received by the commission immediately after its conference with the motormen's representatives. Each conference occupied close to one hour, and upon the retirement of the Interborough company's representatives Chairman John F. Gilchrist and his colleagues announced that the commission had made to the representatives of the company the same offer it had made to the representatives of the motormen, namely, to act as arbitrators of the wage dispute, if acceptable to both sides. The Interbor-

ough company's representative stated, that by reason of their agreement with the Brotherhood of Interborough Employees, the officers of the company could not act without consulting the general committee which had been called to meet at 10 a.m. the following day. They therefore asked that they be allowed until noon that day to give their answer. The representatives of the motormen and switchmen agreed to this.

Mr. Hedley took the stand he did because the contract between the Inter-

borough and the Brotherhood of Interborough Employees provides that all matters of dispute must be submitted to arbitration, to be conducted on behalf of the brotherhood by its general committee, which shall name one arbitrator, the company the other, and in the event that the two fail to agree upon the third, the third shall be selected by a justice of the Supreme Court. He pointed out that he had been urged to stand by the brotherhood and that he had assured the organization he would do so. He said that to consent to treat with the seceders even indirectly through the commission might be regarded by the brotherhood as a breach of contract with that body.

On the morning of July 5 a meeting of the general committee of the brotherhood was held. All of the 62 delegates were present except Messrs. Lavin, Bark and Phelan, representatives of the subway motormen and switchmen. The unanimous opinion of the general committee of the brotherhood, which represents all employees except the subway motormen and switchmen, was that for Mr. Hedley to consent to arbitrate any matter with any group of men who have left the brotherhood would be regarded by the general committee as a breach of faith by him as well as a violation of the contract between the company and the brotherhood.

In consequence Mr. Hedley informed the commission that he was unable to see how he could adopt the suggestion of the commission. He was sure that to do so would jeopardize the public interest in a deplorable manner. He said that any conduct of his which led the loyal members of the brotherhood to believe that they had been betrayed and that their organization was about to be disrupted might result in provoking some 12,000 or 13,000 men to leave the service.



Strike Breakers Quartered in Car Shop to Be Available for Duty

While he was powerless in the circumstances to accept arbitration with the seceders, he requested the transit commission to exercise its powers under the statute and to institute on its own motion a public hearing to find and report to the public all of the facts bearing in any way upon the causes which have led to the existing situation. He felt that a request from the commission to dissatisfied subway motormen and switchmen to continue in the service until the commission had concluded its investigation and reported its conclusions to the public, would insure the continuance of service.

In conclusion Mr. Hedley said that while he desired tranquillity, if he must make a choice, he preferred to face a strike of a few hundred motormen rather than to face a strike which would involve practically the entire force of the company included in the brotherhood.

In view of Mr. Hedley's statement there was no mistaking the company's stand. The situation was up to the representatives of the men who had seceded from the brotherhood. In an effort to make good their boasts they called out such men as they had succeeded in enticing into the new organization, which they termed the Consolidated Railroad Workers.

All the other transportation agencies were quick to come to the aid of the public. In response to a call issued by the Transit Commission, a conference was held in the commission's office on July 2, attended by the operating heads of all the large transportation systems, (except the Interborough Company) and Commissioner Albert Goldman of the Department of Plant and Structures, which has supervision of the municipal bus lines. The entire Transit Commission participated.

Chairman Gilchrist told the conferees that there was a possibility of a strike upon the Interborough Rapid Transit system, and that, a stoppage or curtailment of its service would work great hardship upon the people of New York; and that he had called them together for the purpose of taking precautionary measures.

All of the conferees pledged their co-operation and promised to do all that is possible in the way of providing additional service. It was also suggested that some of the trolley lines which intersect, arrange to exchange facilities, so that the cars of one company may operate temporarily over the tracks of another. Each company also agreed to supply extra cars, both by drawing upon their reserve, and by transferring from crosstown lines to longitudinal lines.

Commissioner Goldman of the Department of Plant and Structures stated that his department would be able to supply from 100 to 150 extra buses, which would be placed on streets where they would be most needed.

At the conclusion of the conference each company was requested to submit to the commission a typewritten statement showing the extent of the extra service to be provided and such changes in operation as it will be necessary to impart to the public, so as to minimize the confusion which may arise from a change in the daily routine. As soon

as this statement was received and tabulated, the commission prepared a statement for the information and guidance of the public.

The following reports show that other transportation agencies have carried considerably more than normal traffic:

Company	Passengers Carried in Excess of Total of July 7, 1925
B. M. T. subway and elevated lines	439,420
Third Ave. surface lines	239,012
B. M. T. surface lines	141,940
Fifth Avenue Coach	108,817
Brooklyn City Railroad	77,060
New York Railways	40,480
Ninth Ave. surface line	40,160
Fourth Ave. surface line	31,520
Eighth Ave. surface line	15,600
New York Central	15,000
Total	1,112,989

The real picture of the accomplishments of the company is best told by the record of service which it has been able to give and by the figures of defection from the ranks and the number of new men trained to fill the strikers'

places. Despite the effort to involve the elevated road in the walkout, service on the elevated lines has been practically normal at all times. Subway service, suffered the first day, for only 30 to 50 per cent of normal service was given. On Wednesday service was about 70 per cent normal and on Thursday the percentage had been increased to 77 per cent normal. The regular number of men employed as motormen and switchmen is 752. Of these more than 700 were induced to go out the first day. Former motormen to the number of 113 and former switchmen to the number of eighteen returned to the service by Wednesday night. Up to Thursday 1,081 men had been examined, of whom 77 were rejected for physical reasons and 276 because of their inability to qualify. By Thursday night the company had available through its intensive system of employment and selection 610 motormen and 249 switchmen, or more than 100 in excess of the normal requirements.

Strike On in Indianapolis

Amalgamated Men, Small Part of Entire Force, Walked Out on July 5—
Service 75 Per Cent Efficient—People Little Inconvenienced

Fewer than 40 per cent of the 1,400 motormen and conductors of the Indianapolis Street Railway, Indianapolis, Ind., went on strike July 5 as the result of a meeting of employees affiliated with the Amalgamated Association. Among other things the men demand reinstatement of between 65 and 70 employees alleged to have been discharged for union activities, recognition of the union, a substantial increase in wages, the amount to be left to an arbitration board, the arbitration of all questions on which the company and union cannot agree, and improvement of working conditions.

A résumé of the traffic situation during the first few days of the strike shows the company operating about 75 per cent normal. On no lines are the cars tied up. The buses are maintaining virtually perfect schedules. The general public does not seem particularly concerned about the strike.

During the past three or four years the Indianapolis Street Railway has escaped censure because it has laid its problems fully before the public and it is generally known the company is not making any money and that its rate demands have been very moderate.

Late on July 6 officials of the company notified the men that all strikers would be restored to their usual jobs if they reported for work not later than 6 p.m. on July 7. The sudden action of the company, coupled with the short time given for reporting, indicates that officials believe they have the situation well in hand and will be able to resume regular schedules without the aid of the strikers.

John M. Parker and Robert Armstrong, international vice-presidents of the Amalgamated, who have been in Indianapolis for several weeks organizing the union, made brief talks at the meeting at which the question of going out on strike was proposed, but they left before the strike vote was taken.

On behalf of the company its officials

on July 6 requested that contempt proceedings be brought against certain employees and officials of the union. Deputies in the District Attorney's office said they were investigating the situation and would bring proceedings if the evidence warranted action. The announcement was made after Alexander G. Cavins, Assistant District Attorney, had consulted with C. W. McPhall, head of the Department of Justice in the Indiana federal district, and after he had conferred with attorneys for the railway.

Officials of the Indianapolis police force have increased the working hours of patrolmen from eight to twelve hours, giving the department a third more men at all times. Emergency squads, heavily armed, are held in reserve at headquarters, ready to be dispatched to the scene of any trouble.

The public is suffering little inconvenience because of the strike of motormen and conductors. At morning and evening rush hours the strike is apparent, but at other intervals during the day and night little difference is noticed. Officials of the company say that 75 men returned to work before the dead-line on July 7, after which the strikers lost their seniority rights. In addition the company has hired 240 new men who have had experience before in car operation, and as soon as they have been amalgamated into active service it is thought cars will be operated with no interruption at all.

It was said by Albert Ward, United States District Attorney, that no action would be taken immediately toward citing for contempt of court some of the leaders in the strike movement for alleged violation of the injunction order issued July 3 by Judge Robert C. Baltzell. Mr. Ward said he was awaiting a report from the Department of Justice before taking action. Up to the present time law violations have been few. Police appear to be vigilant and special details are held at substations.

Philadelphia-Camden Bridge Opened

The great suspension bridge linking Philadelphia and Camden, across the Delaware River, was opened on July 1. The bridge is 1.82 miles long, while its main span alone is 1,750 ft. The main roadway of the bridge can accommodate three lines of traffic in each direction, while paralleling it tracks are reserved for trolley lines and high-speed inter-urban electric trains running to South Jersey towns. An upper level is provided for pedestrians.

With the opening of the bridge Philadelphia and Camden were linked for the first time by a through transportation service. Buses are run from Kaighn's Point ferry of the Philadelphia & Reading Railway, in Camden, to the Camden bridge plaza. Crossing the bridge, the route divides, buses proceeding west by way of Vine Street, Twenty-second and Race, returning over Race Street, and others by way of Eighth Street and Market to and around City Hall, returning over Market and Seventh to the bridge, thence to the Kaighn Avenue ferry.

The buses that operate over Market Street carry only interstate passengers. Stops are made at each street intersection to discharge passengers on the westbound trip and to receive passengers only on the eastbound trip. The fare is 10 cents.

Buses are also operated from plaza to plaza over the bridge at a 5-cent fare. The Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey, which are co-operating in supplying the present service, are studying the desirability of P.R.T. now furnishing a street car service from Camden center city to the Philadelphia plaza station for a 7½-cent P.R.T. fare, pending the building of the proposed Chestnut Street surface car subway connecting with the new line.

The Delaware Bridge Joint Commission, with representatives of New Jersey and Pennsylvania, was created in 1919, and in 1920 Ralph Modjeski, chief designer of the bridge, began his plans. Congress and the War Department approved the project, and construction work began on the Philadelphia side on Jan. 6, 1922.

7-Cent Fares to Continue in Rye and Port Chester

The Public Service Commission of New York under an order issued on June 30 authorized the New York & Stamford Railway, effective on July 1, to continue the present 7-cent fare in Rye and Port Chester until Nov. 1, 1926, unless otherwise ordered and a 5-cent fare in zone 1 between Mechanic Street in New Rochelle and the Harrison-Rye dividing line.

Evidence showed that in 1925 there was a deficit of \$3,367 and an estimated deficit in 1926, based on five months operation, of \$78,900 based on the fares fixed in May 1925. The company further estimated a deficit with the 5-cent fare in zone 1 for 1926 of \$146,267. A 7-cent fare prevails on the company's lines in Connecticut.

It is difficult to see how, in the face

of such operating results and estimates, the commission holds, the company can continue to carry on its operations very long. It appears, however, that it does not expect to do so because the company finds that several months must elapse before bus lines can be started and that public interest demands operation of the lines until the establishment of the bus system.

No doubt the cessation of the railway service at the present time, the commission holds, would be prejudicial to the public interest, and in view of the actual operating results the commission is justified in continuing the present 7-cent fares in the zones within Rye and Port Chester.

Agreement Reached in Tacoma

Terms Announced Under Which Company There Will Operate for Temporary Period

Just 23 days after the new administration of the city of Tacoma, Wash., came into office a definite agreement was reached with the Tacoma Railway & Power Company, providing for at least a temporary settlement of the transportation problem during a test period of from six months to one year. The agreement was reached without any evidence of the bickering and recriminating that have marked the past eight years attempt to come to an agreement, and Mayor Melvin G. Tennant is being congratulated by Tacoma citizens for his fair-minded attitude toward the railway. The company was represented by Richard T. Sullivan, manager; Frank D. Oakley, attorney; C. S. Reynolds, public relations superintendent, and E. Conover, statistician.

Under the proposed test plan, cash fares will drop from 10 cents to 8 cents. Street car tokens will be sold at the rate of fifteen for \$1 at agencies throughout the city. Tokens heretofore have been 8½ cents. The weekly pass plan will be eliminated. This will mean an increase of fare for certain users, but for others it is expected that the rate of fifteen tokens for \$1 will figure out at no higher fare per ride. Traction officials figure there are about 500 out of the present 5,000 to 6,000 pass users who are "professionals," in that they use their passes many times every week. It is said this class is now getting service at less than cost, at the expense of other riders.

Transfers, exchangeable between the private line and the municipal belt line, will accompany the cash or token fares. This will mean a saving for the tideflats worker, who has been forced to pay the usual fare on the private lines and 5 cents more on the tideflats line.

Opportunity is reserved to revise the fare bases during the period of the test. This revision might be up or down, as the result of the test dictates. If at the end of a two-months period it is demonstrated that the fares are beyond hope of producing revenue sufficient to cover the cost of operation, maintenance and fixed charges and leave an annual sum of \$270,000, which the city officials have agreed is reasonable to be devoted to depreciation and return on investment, it is proposed that the

fares be changed in a trial to produce more revenue. On the other hand, if the earnings appear to warrant it a lower fare may be tried.

Under the proposed plan representatives of the city and company will meet once a week to go over figures of the week's business and consider means of increasing efficiency, service and returns, or of reducing costs.

Competing buses will be eliminated under the proposed operation. Buses will be used by the railway only where extensions of service are needed. Three such extensions have been agreed upon.

Wages Advanced in Peoria

After negotiations which have been going on since May 1, Arbitrators Henry Mansfield for the men and E. E. Soules for the Illinois Power & Light Corporation, Peoria, Ill., have reached an agreement in adjusting the wages of the railway and bus employees. Their finding gives all platform men, motor coach, carhouse and shop men an advance of 2½ cents an hour. The award is retroactive to May 1. It will be binding until April 30, 1927. The new rates for trainmen are 48½ cents an hour for the first year, 50½ cents an hour for the second year and 52½ cents an hour thereafter. One-man car operators will receive 5 cents an hour extra. The company operates practically all one-man cars. The new rates for the bus men are 53½ cents an hour for the first year, 55½ cents an hour for the second year and 57½ cents an hour for the third year and thereafter.

Hearings on Fare Petitions Scheduled

Hearings on the petition of the New York State Railways for a higher fare rate in Rome and Oneida will be held before the Public Service Commission at Albany on July 12. In Rome and in Oneida a new maximum rate of fare of at least three tickets for 25 cents and a cash fare of 10 cents are sought in place of the 7-cent fare which has been in existence in Rome since May 25, 1920, and in Oneida since Feb. 7, 1923.

Extra Suits and Valets, Too, in Pittsburgh

Employees of the Pittsburgh Railways, Pittsburgh, Pa., have fallen upon delectable days. Trainmen will hereafter have the choice of two suits of clothes to pick from in lieu of the traditional one and will have the attention of valets to repair linings, replace buttons and clean and press trousers. This metamorphosis came about through an announcement by the company that nine tailor shops with expert tailors in charge had been opened at the company administration building. The new suits will adhere to the present mode of blue serge with pockets and will be topped with the traditional caps on which numbers will be stamped. This action of the company in permitting its employees to a choice of garment is regarded, so one criterion avers, as the first move in a campaign to have the Pittsburgh Railways men set the fashions of the smoky city.

Transportation Committee for Cincinnati

Representatives of the Cincinnati Street Railway and the major bus lines of Cincinnati, Ohio, have organized the "Greater Cincinnati Transportation Committee" to settle all difficulties and problems of transportation arising between electric railway and bus lines. The committee comprises Walter A. Draper, president of the Cincinnati Street Railway; Edwin Becker, representing the Cincinnati Motor Bus Company; Thomas L. Talbentire, president of the City Transit, Inc., and C. McGreight, president of the Blue Bus Company. Edgar Dow Gilman, director of street cars and motor buses of Cincinnati, and W. J. Wiggeringloh, safety director of Norwood, Ohio, are ex officio members. The committee has decided to meet at intervals to discuss transportation matters.

Arbitration Board in Montreal Negotiates on Wages

An arbitration board is hearing the wage dispute between the Montreal & Southern Counties Railway, Montreal, Canada, and its motormen and conductors. The men have petitioned for an increase of from 5 cents to 7 cents a day and for a basic nine-hour day. Bernard Rose, K. C., is chairman of the board. At a recent meeting A. E. Crilley, chief of wage bureau of the Canadian National Railways, held that the cost of living had increased 49 per cent since 1914 and rates of pay had jumped 108 per cent on the interurban lines and 100 per cent on the suburban lines; that to accede to the men's demands would add \$34,000 annually to operating costs. W. J. Babe, vice-president of the Brotherhood of Railroad Trainmen, questioned the cost of the raise as claimed by Mr. Crilley. Members of the board hearing the dispute traveled over sections of the road recently on an inspection tour to gain first-hand knowledge of the manner in which operations are conducted. The Montreal & Southern Counties Railway operates 29 miles of line.

Provisions of Hamilton Agreement Outlined

In accordance with the new agreement entered into recently between Hamilton, Ont., and the Hamilton Street Railway, the company undertakes to improve its service by the expenditure of about \$1,250,000 during the next three years for new cars, buses and carhouses. The vote of the electors approving the contract was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 15, page 859. This public decision terminated a period of dissension which started in December last year following the defeat of two railway by-laws, one providing for the city's purchasing the system and the other for granting to the Hamilton Street Railway a 25-year franchise. At that time negotiations resulted in a continuation of the service pending the completion of a new contract.

The essential points of the new agree-

ment provide that the fares shall be just and reasonable; that for the next two years the present 5-cent fare shall remain in force; that the company is to have the exclusive privilege of carrying people by any means except cabs and taxicabs; that the existing jitney licenses shall be issued and no transfers of licenses allowed; that after the expiration of two years no jitney licenses will be renewed. Other features of the agreement refer to the financial obligations assumed by the company in relationship to the city. In the past the city collected about \$100,000 a year for mileage and percentage. These charges are dropped. The cost of snow removal used to be divided equally between the city and the company. According to the new agreement the city will bear 60 per cent of the cost and the company 40 per cent. The company will also be permitted to run one-man cars and to carry advertising on the outside of the cars. Both of these were formerly forbidden.

News Notes

Six-Cent Fare Continued.—The Transit Commission has authorized the New York & Queens County Railway, operating between Corona and College Point and between Flushing and Jamaica, in Queens, N. Y., to continue its 6-cent fare for another year. The increase from 5 cents to 6 cents was ordered by the Supreme Court in Long Island City in 1924, when Lincoln C. Andrews, receiver of the company, asked that 1 cent be added to the fare for every \$100,000 spent by the company for paving between its tracks.

Wage Contract Renewed.—The contract between the Shreveport Railways, Shreveport, La., and its employees, which was in force prior to July 1, 1926, has been continued for another year, without modification.

One-Man Cars Will Be Tried.—One-man cars will be placed in service in Memphis, Tenn., within the next few weeks by the Memphis Street Railway to effect a saving in operation of costs to be applied to better service. Collectors of fares will be placed on the ground at busy corners downtown.

Increased Fares in Hannibal.—The Hannibal Railway & Electric Company, Hannibal, Mo., has been granted permission by the Missouri Public Service Commission to increase its fares to 8 cents for adults and 4 cents for children. Tokens are two for 15 cents and children's tokens 3½ cents apiece. These rates are a 2-cent increase for adults and a 1-cent increase for children over the former rates. The new rate is expected to show a return of 10.7 per cent for depreciation and profit. The commission fixed the value of the property at \$219,711.

Increased Tariffs on Special Tickets Sought.—The Chicago, Aurora & Elgin Railroad, Aurora, Ill., has filed a petition with the Illinois Commerce Commission asking for authority to raise its tariffs 20 per cent on its monthly

commutation tickets, ten and 25-ride coupons and special one-day limit tickets. No increase is sought for regular fares and school children's fares. If the increase is granted it will be effective July 15. President Budd asserted that the return is not sufficient to provide for necessary development and that existing rates are lower than the rates of other competitive lines. He stated that the actual return to the entire property was only 3.54 per cent last year. On June 15 the company filed a petition with the commission in which permission was asked to increase passenger rates 15 per cent.

Fare Case Postponed.—The hearing scheduled for July 6 on the petition of the United Traction Company, Albany, N. Y., for increased fares in various municipalities served by it has been postponed until July 27.

Token Carriers Free in Akron.—The Northern Ohio Power & Light Company, Akron, Ohio, is giving free to its car riders for the time being a nickel carfare token carrier easily carried in the pocket. It will serve as a preventive against the loss of metal tokens and will help speed up service. Patrons are instructed to hand the conductor a quarter and say, "Four checks and a carrier."

Choice Between Bus and Railway Service.—A more flexible development in transportation service has been started by the Wisconsin Power & Light Company on its intercity line connecting Fond du Lac, Oshkosh and Neenah. Under this new plan patrons will have the choice of electric railway or bus service. Effective July 1, alternate hourly service is offered, with interurbans leaving the terminal on odd hours and buses on the even hours. The fares for each service will remain the same, with interchangeable commutation tickets.

President's Office Changed.—The address of the president of the Southwestern Public Service Association has been changed from Mineral Wells, Tex., to Dallas, Tex. The office is held by Harold E. Borton, whose election to the presidency was referred to recently in the ELECTRIC RAILWAY JOURNAL.

East St. Louis Track Case Under Advisement.—Judge Lindley in the federal court of Danville, Ill., on June 25 heard arguments on the application for a permanent injunction to restrain the city of East St. Louis from tearing up the tracks of the East St. Louis Railway on Third Street. The case was taken under advisement by the court. The question of whether the Public Utilities Commission or the municipalities shall control local public utilities is of state-wide interest. In Chicago, a similar question will likely arise with the expiration of the surface car franchises. That city was represented at the East St. Louis hearing.

New Line Completed in St. Petersburg.—The Shore Acres extension of the Masonic Home street car line became a part of the Municipal Railway of St. Petersburg, St. Petersburg, Fla., on July 1 when a deed to the development was turned over to city officials by heads of the Shore Acres and Snell Isle development companies. Dedic-

tion ceremonies were held at the end of the line in Shore Acres Center. This extension of 3 miles is the longest addition to the system since the car line was run out West Central in 1913. It cost the developers approximately \$90,000 and was turned over to the city free of any encumbrance.

Wage Scales Continued.—A new working agreement has been made between employees on the old Northwestern Ohio Electric line connecting Toledo, Oak Harbor and Port Clinton and the Ohio Public Service Corporation, present owner. The contract provides for continuing the wage scales, which average about 57 cents an hour, but permits employees to reach the maximum scale at the end of one year instead of three years. The agreement expires in November.

Wage Board Holds Hearing.—An arbitration board selected to hear testimony of the East St. Louis & Suburban Railway, the Alton, Granite & St. Louis Traction Company and their employees regarding the adequacy of the present wages paid to carmen and other workers held its first hearing in East St. Louis, Ill., June 28. The board consists of five members. B. F. Thomas and C. E. Smith represent the company, W. L. Perry local union No. 805 and J. L. McMurdo local union No. 125, while Frank Slater, an attorney of St. Louis, Mo., is chairman and neutral member of the board. The carmen are affiliated with the Amalgamated.

Injunction Petition Dismissed.—Judge Henry C. McDowell, in the Federal District Court at Lynchburg, Va., has dismissed the petition of the Lynchburg Traction & Light Company against the city of Lynchburg for a permanent injunction to restrain the city from enforcing its ordinance for a 5-cent fare in the parts of the city annexed from Campbell County on Jan. 1, of this year. The court held that it had no jurisdiction and that the ordinance was not repugnant to the Constitution of the United States. The case was dismissed without prejudice to the complainant company.

Railway-Bus Between Milwaukee and Madison.—Co-ordinated railway and bus service between Milwaukee and Madison will be offered by the Milwaukee Electric Railway & Light Company commencing on July 8, which will result in faster and more frequent service. Through bus service over Highway 19 between these cities will be discontinued. Under the new feeder arrangement buses from Madison will connect at Watertown with the company's newly completed rapid transit line, which has cut the running time between Milwaukee and Watertown to three hours. Patrons wishing to travel via bus between these two cities will be provided with through bus service over Highway 41 hereafter.

Would Abandon Two Lines.—Application has been made to the Dover and New Philadelphia City Councils by the Northern Ohio Power & Light Company to abandon what is known as the "New Line" between the two cities. The distance is a little more than 3 miles. The company will offer bus service for the remainder of the franchise, or for two years.

Recent Bus Developments

Further Expansion of Akron Bus Service

The twenty 29-passenger, modern six-wheel buses now being built for the Akron express lines of the Northern Ohio Power & Light Company are expected to begin to arrive July 10 from the Kuhlman Car Company, which is building the bodies. Chassis are the product of the Six-Wheel Company, Philadelphia. They are single-deck buses.

At the same time six other six-wheel buses of the 27-passenger type will be delivered for use in Canton. The Canton buses are also modern to the minute. They will be used on the Sixth Street, Prospect, Ninth Street and Maryland Avenue lines. They will probably be in service by July 15.

The Akron Market Street express line will be started July 15. It will operate across town. It is hoped at the same time to extend the Main Street-Cuyahoga Falls express line to Firestone Park over South Main Street for convenience of patrons in that section.

Details of operation are now being worked out and stops provided.

Engines used in these buses are of a six-cylinder type. They will provide a high-class service between East Akron and West Hill at a 10-cent fare.

International May Operate Buffalo Taxis

Negotiations are reported to be under way by the International Bus Corporation, Buffalo, a subsidiary of the International Railway, for a merger of two taxi lines in Buffalo with the bus company. The taxi lines involved in the negotiations are the Yellow Cab Company and the Van Dyke Taxi & Transfer Company. These are the two largest taxicab companies operating in Buffalo and the plan under consideration is reported to be somewhat similar to the merger of transportation lines in Philadelphia by Mitten Management, Inc.

Council Postpones Abandonment —Bus Plan in Davenport

The City Council of Davenport, Iowa, has postponed action on the application of the Tri-City Railway to abandon a portion of its trackage, to reroute the Fejervary Park and Le Claire Street and Oakdale line and to begin the operation of buses on a portion of its system here. Approval of the application was expected at an adjourned meeting of the Council on June 22, but minor changes were asked in the resolution indorsing the application and final action was held over until the next Council meeting, set for July 7.

It is also rumored that a majority in favor of the application was lacking at the last meeting and that postponement of the vote was taken partly for this reason. Specifications on eventual

replacement of paving on streets where car lines are to be abandoned is said to have been one of the points on which a difference of opinion developed in the Council.

Four-Mile Line in Operation in Chicago Suburbs

Operation of buses on Roosevelt Road between Ninth Avenue in Maywood, Ill., and Seventeenth Avenue in Broadview, Ill., has been begun by the Chicago & West Towns Railway. The new route is an extension of the company's old Roosevelt Road line in Maywood. It is 4.1 miles in length. In accordance with the terms of the certificate granted by the Illinois Commerce Commission on June 17, two buses have been placed in this service.

New Terminal Opened in Baltimore

With Gov. Albert C. Ritchie of Maryland and Mayor Howard W. Jackson of Baltimore taking part in the ceremonies, the Union Bus Terminal Company opened its union terminal at Redwood and Liberty Streets, Baltimore, on June 30. The building is a handsome two-story structure with ample room for all departments and for the convenience of the public. July 1 brought about the actual placing in service of the new terminal. At that time six important bus lines that have been starting from various points in the city began operations from the new station. It is expected that others will make it their headquarters soon.

The companies that are using the terminal are the Washington Motor Coach Company, which operates buses every hour between Baltimore and Washington; the Furlin Shore Lines, making the terminal its only stop in Baltimore in connection with its Baltimore-Atlantic City service; the Palace Coach Line, Inc., operating between Washington and New York; the Conoway Motor Company, maintaining service between Baltimore and Westminster; Taneytown and Emmitsburg, Md.; the People's Rapid Transit Company, operating from Baltimore to Washington, Philadelphia, New York and Atlantic City, and the Red Star Lines, maintaining service from Baltimore to York, Harrisburg and Philadelphia. Among the owners of lines operated from the terminal are Day & Zimmermann and the Philadelphia Rapid Transit Company.

Not Permitted to Operate Until September.—The Public Service Commission extended on June 29 the time in which Wilbur P. Menke, operator of buses in Philadelphia and Montgomery Counties, can operate his cars from June 1 to Aug. 31. On the latter date all rights and privileges granted to him by the commission will cease, and the Philadelphia Rural Transit Company,

subsidiary of the Philadelphia Rapid Transit Company, will furnish the bus service.

Would Run Line of Three Miles.—The Bus Transportation Company, a subsidiary of the Denver Tramway, Denver, Col., which lost out in the May, 1925, election when it sought to operate buses as feeders to the railway, has asked the Public Utilities Commission for permission to operate buses from the end of the car line at Aurora to the Fitzsimmons Hospital, a distance of about 3 miles. There have never been any street cars beyond Aurora. The plea has been docketed.

Buses in Prospect.—The Scranton Railway, Scranton, Pa., recently received permission from the Public Service Commission to abandon its 7,100 ft. of track from the New York, Susquehanna & Western Railroad crossing in the Borough of Old Forge to the Luzerne County line. This branch will be out of service by July 11. The Wyoming Bus Company, a subsidiary of the Wilkes-Barre Railway and the Glen Bus Company, have applied to the Public Service Commission for certificates of public convenience for the operation of buses over this territory.

Opposes Bus Line.—The Milwaukee Electric Railway & Light Company has expressed its opposition to the application of the American Coach Lines, Inc., which plans to provide service between the east side and downtown sections of Milwaukee, Wis. The American Coach Lines, Inc., now operates the Green Bay-Milwaukee intercity bus line. Action on the application has been laid over by the Council in order to give property owners and business men an opportunity to express their views on the necessity of the new line. The railway, which supplies service over the routes proposed, contends it has prior rights to these streets; that they are at present already overcrowded with traffic, and that to permit another bus line in the downtown section would be unfair to the public and merchants.

Route Extension Denied.—A petition by the Gary Railways for an extension of its bus routes in East Chicago, Ind., was denied by the Indiana Public Service Commission. That body held that the territory for which the petition was written is already amply provided with bus service.

Would Operate Buses Instead of Cars.—The United Light & Power Company has asked the Nebraska Railway Commission for authority to begin substitution of buses for street cars in the city of Lincoln. In this city the company recently purchased all of the stock of the Lincoln Traction Company. Outlying lines to the state penitentiary and state hospital have been selected for abandonment first.

Bus Substitution in Prospect.—The Olean, Bradford & Salamanca Railway, Olean, N. Y., has announced that it will replace one of the interurban cars on the Olean-Bradford line with a bus. Abandonment of the interurban line between Portville and Bolivar is planned by the railway and a hearing on the company's application will be held by the Public Service Commission. If the interurban route is abandoned, the

railway will substitute bus service between Portville and Bolivar. The company recently abandoned its electric line between Salamanca and Little Valley and is now operating buses there.

Opposes Bus Certificate.—The Worcester Consolidated Street Railway, Worcester, Mass., at a recent hearing before the Massachusetts Department of Public Utilities, opposed the granting of a permanent certificate of public convenience and necessity to the Carlstrom Bus Lines for three sections of the present route of the lines between Worcester and Marlboro and between Westboro and Hopkinton. Competition with the street railway was the basis for the opposition.

Buses to Be Installed.—The City Council of Alexandria, La., has been authorized to abandon the Municipal Street Railway and to install buses. It was also granted the privilege of giving a franchise to a private concern to operate buses. The Municipal Street Railway of Alexandria operates 7 miles. It was purchased by the city from the Southern Traction & Power Company.

New Bus Line in Toledo Planned.—Electric railway service on Front Street, Toledo, Ohio, is rapidly being replaced by bus service, according to a statement in the May report of the Community Traction Company. It is said that the entire line will be equipped to operate with new buses on Aug. 1.

Bus Service May Follow Abandonment.—The Indianapolis Street Railway, Indianapolis, Ind., has received authority from the Public Service Commission to abandon its railway service in Pershing Avenue. This consists of a one-car feeder service between Tenth Street and Emrichsville. At the insistence of Frank Wampler, commissioner, the commission stipulated that the service shall not be abandoned until the construction work on improving the street actually is begun by the city. After the street car service is abandoned the commission will require the company to provide bus feeder service at the rush hours.

Tulsa-Oklahoma City Bus Line Proposed.—Bus service between Tulsa and Oklahoma City, Okla., is proposed in an application submitted to the Corporation Commission by the Union Transportation Company of Tulsa. This company is under the same management as the Oklahoma Union Railway. If the Corporation Commission grants the application the fare will be the same as the railroad chair car rate and the time four hours and 35 minutes. The route will pass through Kellyville, Bristow, Stroud, Chandler, Meeker and Choctaw.

Bus Line Between Syracuse and Auburn.—The Public Service Commission on June 18 granted permission to the Mid-State Coach Lines, Inc., bus subsidiary of the Auburn & Syracuse Electric Railroad, to operate a bus line between the city of Syracuse and the city of Auburn, N. Y. The route will start at the interurban trolley station in Syracuse and will proceed over the Genesee Turnpike to the city line of Auburn, and thence to the trolley terminal on State Street in that city. The total distance traveled will be approxi-

mately 25 miles. Consents to the operation of the proposed line have been granted by the cities of Syracuse and Auburn and by the various towns and villages along the line. Five round trips will be operated daily and the through fare will be \$1. It is proposed to use modern suburban buses. The Mid-State Coach Lines, Inc., now operates bus lines in the city of Auburn and in the city of Oswego.

Will Cover Former Railway Ground.—The Public Service Commission granted a certificate recently to the Schenck Transportation Company, Inc., to operate a bus line between Mineola and the Nassau-Queens county line, serving Mineola, Floral Park, Bellerose and parts of the towns of Hempstead and North Hempstead. The bus line will give service in territory formerly served by the New York & Long Island Traction Company.

Partial Bus Service Planned in Ottumwa.—The City Council of Ottumwa, Iowa, passed a resolution recently specifying the abandonment of railway service on the Court Hill line and the substitution of bus service. It is proposed to charge the Iowa Southern Utilities Company, successor to the Ottumwa Traction Company, a license fee of \$25 a year for each bus. The company will buy three new buses for the line. The same schedule and fare will be kept.

Temporary Service in Colorado.—The Colorado Springs & Interurban Railway has been authorized by the Public Utilities Commission to operate buses between Colorado Springs and Manitou from June 15 to Oct. 1, every year. The distance is about 3 miles. It also covers the route by electric railway.

From Philadelphia to Niagara by Bus.—The Philadelphia Rapid Transit Company recently announced the starting of a new bus service between Philadelphia, Pa., and Niagara Falls, N. Y., with the first tour on July 3. The trip will occupy two days each way, with stop-over privileges in Buffalo. The northbound route will follow the Lackawanna Trail, through the Delaware Water Gap and the Pocono Mountains, with a stop the first night at Binghamton, N. Y. The return trip will be made over the Susquehanna Trail, with Williamsport, Pa., as the stopping place. Buses leave Philadelphia every Wednesday and Saturday and Buffalo every Tuesday and Saturday.

New Bus Service Installed.—A new city bus line extending into the northwest section of Sheboygan, Wis., has been placed in service by the Wisconsin Power & Light Company in response to a petition presented to the Common Council. The service will be provided under a temporary arrangement by which the line may be discontinued if patronage should prove unsatisfactory. The company recently established bus service to the southwest section.

Buses Await Commissioner's Approval.—The City Council of Massillon, Ohio, has agreed to permit the abandonment of the Northern Ohio Power & Light Company's line and substitution of buses if the Stark County Commissioners will approve the same. Application has been filed with the County Commissioners.

Financial and Corporate

Sale of Maryland Road Under Foreclosure July 27

In connection with the Circuit Court decree of June 17 appointing Walter C. Capper and Elmer J. Carter, trustees, to sell all the real and personal property, franchises and equipment of the Cumberland & Westernport Electric Railway, Cumberland, Md., the property will be offered for sale on July 27. The decree follows default in payment of the interest and principal on bonds secured by mortgages of which the Real Estate Trust Company, Philadelphia, is trustee.

The railway operates trolleys from Cumberland to Frostburg along the National Highway and buses from Frostburg to Midland, Lonaconing, Barton and Westernport, cars having been withdrawn a year ago from its rails between these points. The line is a consolidation of three separate companies. The property will be offered in three separate parcels and then sold as a whole. The franchise covers a right-of-way between Cumberland and Frostburg and through the thickly settled sections of the entire George's Creek Valley.

Havana Property Passes to Electric Bond & Share

Purchase of the common stock from the voting trustees of the Havana Electric Utilities Company, the successor to the Havana Electric Railway, Light & Power Company, by the Electric Bond & Share Company has been consummated. The deal terminates the voting trust of the purchased company, and out of the purchase price of \$33 a share the holders of voting trust certificates will receive \$31.50 a share.

The Electric Bond & Share was already the owner of a substantial number of the certificates and a majority of the outstanding preferred stock. It has been said that the latest purchase was preliminary to a rearrangement of the affairs of the operating subsidiary. The expectation is that Electric Bond & Share will transfer its holdings to the American & Foreign Power Company, Inc.

Ohio Traction Deal Approved

Stockholders of the Ohio Traction Company have approved the plan drafted by committees representing the preferred and common shareholders for merging the assets of the company with those of the Cincinnati Car Company. The new company will be known as the Cincinnati Car Company. There will be an organization meeting soon at which officers will be elected. Each holder of preferred stock is to receive 2½ shares of stock without par value in the reorganized company for every share held previously and each holder of common will receive one share without par value for each three shares of deposited common stock. The plan of the committees calls for the purchase

of all assets for approximately \$6,000,000. The assets included \$1,700,000 in cash on hand and liberty bonds, the Traction Building, Chester Park, the Cincinnati Car Company shops and 86,661 shares of Cincinnati Street Railway. In addition the committees will assume all existing liabilities, including ground rents under perpetual leases on the Traction Building and ground rents under perpetual leases on the Chester Park property.

Reorganization of Properties in Middle West Explained

The pending reorganization of the North American Light & Power Company, the holding company which owns the common stock of the Illinois Power & Light Corporation, the Missouri Power & Light Company and other related public utility properties, will not affect the Illinois Power & Light Corporation, Missouri Power & Light Company, or any of the operating subsidiaries of the North American Light & Power Company. All of them will continue to be operated as at present.

In the reorganization of the holding company, Clement Studebaker, Jr., will retain his holdings of the common stock and will remain as president and directing head of the holding company and all its subsidiaries. Certain new financing is in prospect, after which several new interests will come into the company and become associated with Mr. Studebaker in the ownership of common stock, among them the North American Company and Middle West Utilities Company. When the reorganization is completed the entire common stock ownership will be in these interests.

The new line-up will add to the financial and credit background and strength of the reorganized holding company and will facilitate the interconnection of these groups. The operating properties now controlled by the North American Light & Power Company adjoin in many places the operating properties of the Middle West Utilities Company and its allied companies. This is also true of the North American Company, although none of these operates in the same place.

Negotiations have long been in progress for the interconnection by high-voltage, long-distance transmission lines of the power sources of the three holding companies concerned and their subsidiary operating companies. Such interconnections will cover practically the entire Middle West.

As indicated previously the operating properties of the North American Light & Power Company include the Missouri Power & Light Company, the Illinois Power & Light Corporation and its subsidiaries in Des Moines, Iowa, and surrounding territory and in Topeka, Kan., and surrounding territory. It owns also the McKinley Bridge at St. Louis and the Illinois Traction System, the longest electric trunk line railroad in the world.

Falling Off in Passenger Revenue on Gloversville Line

The passenger revenues on the electric division of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., for the year ended Dec. 31, 1925, were \$689,449, against \$722,405 in 1924. The corporate surplus on Dec. 31, 1925, was \$434,015 and depreciation reserves \$686,980. These facts were contained in the fifty-fifth annual report to the stockholders.

SUMMARY OF PASSENGER TRAFFIC, FONDA, JOHNSTOWN AND GLOVERSVILLE RAILROAD

Year	Number	Mileage	Revenue
1905.....	3,888,198	19,440,990	\$384,698
1906.....	4,546,843	22,734,215	434,120
1907.....	5,033,855	25,169,095	478,311
1908.....	5,000,041	25,000,205	468,375
1909.....	4,893,647	24,468,235	474,720
1910.....	5,536,312	27,681,560	534,665
1911.....	5,827,561	29,137,805	560,881
1912.....	6,090,627	30,453,135	565,836
1913.....	6,563,826	32,819,130	594,515
1914.....	6,695,788	33,478,940	598,846
1915.....	5,994,376	29,971,880	536,479
1916.....	6,877,764	34,388,820	610,094
1917.....	7,240,114	36,200,570	662,177
1918.....	6,672,802	33,364,010	675,477
1919.....	6,380,973	31,904,865	749,807
1920.....	6,612,659	33,063,295	828,760
1921.....	5,269,512	26,347,560	806,869
1922.....	5,579,227	27,896,135	816,464
1923.....	5,419,650	27,098,250	778,124
1924.....	5,019,498	25,097,490	722,405
1925.....	4,912,818	24,564,085	689,448

INCOME ACCOUNT OF THE FONDA, JOHNSTOWN AND GLOVERSVILLE RAILROAD COMPANY

Railway Operating Revenues:	1925	1924
Freight revenue, steam division.....	\$453,287	\$454,614
Passenger revenue, steam division.....	36,977	39,038
Passenger revenue, electric division.....	689,448	722,405
Mail revenue.....	5,025	5,754
Express revenue.....	40,476	38,060
All other revenues from transportation.....	8,421	6,904
Revenue from other railway operations.....	12,205	13,087
Total operating revenues.....	1,245,843	1,279,864
Railway operating expenses:		
Maintenance of way and structures.....	\$165,077	\$164,159
Maintenance of equipment.....	149,362	147,508
Traffic expenses.....	7,935	7,518
Power.....	68,948	70,879
Transportation expenses.....	351,050	361,643
General expenses.....	78,781	84,172
Total operating expenses.....	\$821,156	\$835,882
Net revenue from railway operations.....	\$424,686	\$443,982
Railway tax accruals.....	86,199	92,235
Railway operating income.....	\$338,487	\$351,747
Miscellaneous operations (Saucandaga, N. Y., summer resort)—income.....	20,413	18,791
Operating income.....	\$358,900	\$370,539
Non-operating income.....	65,120	62,346
Gross income.....	\$424,021	\$432,885
Deductions from gross income other than interest charges....	62,900	62,346
Balance (available for interest charges).....	\$361,121	\$370,539
Interest charges.....	318,167	315,240
Net income (available for dividends).....	\$42,953	\$55,298
Total dividends for year (preferred stock).....	30,000	30,000
Balance to profit and loss.....	\$12,953	\$25,298

Capital expenditures for the year have been confined to paving in cities, required by statute, and to the improvement of existing property. There was charged to investment, road and equipment expenditures for additions and betterments as follows: Paving cities of Amsterdam, Johnstown and Gloversville, \$4,964; other improvements, \$4,730, or a total of \$9,694.

No securities have been issued since 1911 other than \$550,000 of 4½ per cent bonds in the year 1922 to retire an equal amount of 6 per cent bonds maturing in October and November of that year. All additions to property and equipment since 1911, amounting to \$766,781, have been met from surplus earnings.

The Fonda, Johnstown & Gloversville Railroad operates 82 miles of line.

An Innovation in Financial Advertising

The old order changes in investment practices as in everything else. It is a very interesting development, too, this latest announcement, of concern to utility operators and manufacturers. In the usual course of business the investment house participation in the financing of commercial, industrial and public utility companies is a process of the latter seeking out the former as a purchaser. Now, however, one of the leading investment houses in the country, Hornblower & Weeks, New York, is advertising its preparedness to purchase the entire bond issues of sizable and sound American railroads, utilities and industrial companies.

The popular conception of the investment house is that of a seller of securities. This is only natural, because its contact with the public is largely as a distributor of securities to individual investors. The question of the source of these securities is one to which the average layman gives little attention. The investment house, however, exercises a dual function, and purchasing security issues is fully as important as retailing them. So the firm of Hornblower & Weeks, a member of the New York, Boston, Chicago, Cleveland, Detroit, Providence and Salt Lake City Stock Exchanges and of the Investment Bankers Association of America and the American Bankers Association, rendering a specialized service to investors, is stressing its service to the corporation. These facilities include a stock department, handling stock accounts either on a cash or conservative loan basis; a bond department, which buys and sells all issues of bonds and notes of the United States and foreign governments, municipalities, railroads and equipment trusts and public utility and industrial corporations. This department also deals in high grade industrial and public utility stocks. Its unlisted securities department purchases or sells and secures quotations on all unlisted securities wherever a market exists. A statistical department analyzes securities, reports on market conditions, financial statements of different companies, appraises inventories of securities, furnishes all statistical data and assists in the making of tax returns. Its underwriting department arranges financing for municipalities, railroads, public utility and industrial corporations in any form desired. An expert engineering division is at the disposal of this department and it employs legal talent which specializes in corporate finance. A note department negotiates loans secured by approved collateral for corporations and individuals.

Basis Announced for Terre Haute Exchange

Holders of the common stock of the Terre Haute, Indianapolis & Eastern Traction Company have received letters from a committee representing the shareholders suggesting an exchange of their stock for preferred stock of the Indiana Electric Corporation, which is to be the name of a new corporation resulting from the merger of the Terre Haute, Indianapolis & Eastern and the Central Indiana Power Company.

The committee named the Land Title & Trust Company, Philadelphia, as depository. The proposed financial set-up provides for the exchange of ten shares of common stock of the Terre Haute, Indianapolis & Eastern for one share of participating adjusted preferred stock of a par value of \$100 of the new corporation. Holders of the 5 per cent cumulative preferred stock of the Terre Haute, Indianapolis & Eastern have provided for a share for share exchange for the preferred stock of the new company.

Traffic Fare and Wage Figures Reported

Electric railway passenger traffic in the month of May continued to show an improvement over the corresponding month of 1925. The number of revenue passengers, including revenue bus passengers, reported to the American Electric Railway Association by 207 companies for May, 1926, compared with May, 1925, was as follows:

May, 1926	806,401,269
May, 1925	792,564,416
Increase, per cent	1.93

The average cash fare in cities of 25,000 population and over was:

	Cents
June 1, 1926	7.6946
May 1, 1926	7.6689
June 1, 1925	7.5330

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 miles or more of single track:

	Average Hourly Rate (Cents)	Index Number 1913 = 100 (Per Cent)
June 1, 1926	56.73	208.18
May 1, 1926	56.67	207.96
June 1, 1925	56.20	206.24

Mauch Chunk Road Sold

The East Penn Electric Company, a subsidiary of the Pennsylvania Power & Light Company, has purchased the road and equipment of the Mauch Chunk Transit Company, Mauch Chunk.

It is the intention of the East Penn Electric Company to overhaul the road and to equip it with modern cars. This road traverses one of the beauty spots of America.

Pittsburgh Refinancing Plan Completed

Plans for refinancing of the Pittsburgh Railways, Pittsburgh, Pa., subsidiary of the Philadelphia Company, is practically completed. A general re-funding mortgage bond issue will be sold to retire all the outstanding mort-

gage bonds of the component companies. These amount to about \$11,575,000. Of these, two issues totaling \$489,000 have matured, but holders agreed to accept continuation of regular interest pending the recapitalization.

Denver a Stockholder in Its Tramway

The city of Denver, Col., became a stockholder in the Denver Tramway by accident. The tramway owed the city some back franchise taxes and did not have the ready money, so it sent some of its preferred stock, 275 shares. On June 19 the city received a check for \$1,031, dividends on its stock. Mayor Stapleton said: "I've got some stock to sell and I'm looking for a buyer." The City Council agreed to take the stock to co-operate with the tramway in its reorganization.

Allowed to Operate for Ninety Days.—Judge Will M. Sparks has granted authority in the Probate Court at Rushville, Ind., to permit the Indianapolis & Cincinnati Traction Company to operate 90 days longer. Judge Sparks acted favorably on a petition filed by Charles L. Henry, receiver and former president of the company, asking for an order to issue receiver certificates in the sum of \$156,000 to renew outstanding certificates falling due. The petition set out that the company did not have the money to meet the notes, and to keep the line operating it would be necessary to sell more 90-day certificates and to renew the notes which came due on June 26. Attorneys for the company's creditors objected to having the petition granted.

Vacancy on Directorate Filled.—Allen D. Jones, general auditor of the Interstate Public Service Company, Indianapolis, Ind., has been elected a member of the board of directors to succeed the late Bert Weedon.

Stock Acquisition to Build Up Line.—The Public Service Commission has authorized the Mohawk-Hudson Power Corporation to acquire and hold more than 10 per cent of the preferred and common stock of the Eastern New York Utilities Corporation, which now serves Rensselaer, Hudson and other municipalities in New York and operates an electric railroad between Albany and Hudson, covering 58 miles. The Mohawk-Hudson Corporation contemplates building up the electric road by adding bus feeders both to carry passengers and freight, thereby increasing the revenues of the electric railroad.

Four Months Traffic Report Shows Improvement.—The United Railways & Electric Company, Baltimore, Md., carried 75,364,849 passengers during the first four months of 1926, against 74,716,758 for the corresponding period of the previous year.

Purchase of Substations Arranged.—Purchase for \$119,000 of the West Seattle and James Street substations of the Puget Sound Power & Light Company is provided in an ordinance introduced in the City Council recently by the utilities committee. The deal for the stations has been delayed for more than a year because the Council and the company were unable to agree.

Book Reviews

The Highway and Its Vehicles

By Hilaire Belloc. The Studio, Ltd., London. 40 pages of text, 131 plates. 3 guineas.

The manner of our ancestors in their boudoirs, at banquets and on battlefields has been the subject of story and song for centuries, but not so often have they been met on the highways, and then only in very isolated cases. Through the concentration of a historian of no mean gifts, a fascinating and chronological record of our forefathers on the roads has now been presented. As if his words were not sufficiently convincing nor stimulating, Hilaire Belloc has enhanced the interest of his account, "The Highway and Its Vehicles," with 130 illustrations (24 of which are in color) collected by the Studio Company of London in a limited edition. The flight of a Flemish lady, pilgrims leaving Canterbury, Queen Elizabeth's visit to Blackfriars, a Florentine fête and a Milan masquerade are pictorially prominent in the romance of the highway, as explored by Mr. Belloc. This time, however, he has deviated from his usual practice. The gallant who halts the progress of the French sedan chair to kiss the hand of her ladyship, the stagecoach quipster traveling from London to Windsor, the carrier of the Spanish litter and the driver of the Russian droshky travel unnoticed past him, but the vehicles they ride in fascinate him and allure the reader, too.

Whither the vehicles go, the highway is sure to follow, with the bridge trailing after. This is a logical precedence, according to this historian. Then, too, there is historical evidence that the vehicle preceded the highway and was the cause of it. In early times barbarians moved about accompanied by wagons which did not traverse any roads, and the chariots of Greece and Roman Britain and Gaul fought upon unmade ground. A more modern proof is to be found in American colonization, where, he claims, the "Covered Wagon" has symbolized the nineteenth century movement toward the Rockies.

It was the invention of the wheel, a device to grind corn, mold clay, announce the direction of the wind and much later to effect Swanson close-ups, that brought about the vehicle that brought about the highway. The wheel is the work of man—"a creation he can well feel proud of."

It was not until the seventeenth century that general travel on wheels superseded the muleback and horseback era. Then came a change in the highway known as the turnpike, and by the nineteenth century general transportation by coach had ceased to be the exception and was the rule. Along with the evolution of the modern highway he flashes a picture showing the bicycle, the internal combustion engine, the railway epoch and the various transport eras down to the motor car period of the last twenty years.

But now all these processes have ceased, according to Mr. Belloc, and "we are in the midst of a vast, sudden and hitherto undigested and only half-comprehended revolution in the highway and its vehicles." The advent of the internal combustion engine producing the modern motor car has resulted in the combination of three incompatible things—the old narrow local highway gage, in most countries winding lanes with "blind" corners, and high speed. Something must give way—which is it to be? There are three factors which enter into the problem: First, the high cost of production; second, the disturbance of individual interest, and, third, our uncertainty about the future. But the greatest of these is the doubt about future transport. This hesitancy whether to metamorphose quickly a transportation system is a natural reaction in a generation which has seen so many and such rapid changes in that field. Mr. Belloc sees an interesting parallel in the tramway systems of European towns, which have occasion to feel the inroads of the motor car.

In the larger sense the new vehicle has not "made" the modern highway, as yet. However, Mr. Belloc's explorations on the highway lead him to suggest the end of the process—the restriction of heavy and rapid traffic to the main roads, provided the motor car has come to stay and is not replaced by any different form of vehicle.

Weary as we are from the wranglings over modern highway congestion, a glance at this pictorial epic of Europe on foot, on horseback and in coaches will delight the eye and a perusal of this romantic history will offer a needed respite. From the standpoint of printing, typography and illustration "The Highway and Its Vehicles" is the epitome of art.

Electrical Characteristics of Transmission Circuits

Compiled by William Nesbit, Westinghouse Technical Night School Press, East Pittsburgh, Pa. 317 pages. \$6.

This is a revised and enlarged edition, a reprint of a series of articles which appeared in the *Electric Journal* in 1922, with all the material of the previous work brought up to date and a considerable amount of new material as well. There are 22 chapters in this book with 28 charts and 102 tables.

A Bibliography on Research

By the National Research Council, Division of Engineering and Industrial Research, New York, N. Y. 46 pages.

This booklet lists selected articles from the technical press of 1923, 1924 and 1925. The primary purpose in compiling and cataloging these references, according to Maurice Holland, director of the Division of Engineering and Industrial Research, was an effort on the part of the division to "feel the pulse of industry" and to maintain a close contact with its research activities.

The Ethics of Business

By Edgar L. Heermance. Harper & Brothers, New York, N. Y. 244 pages. Price \$2.

Whatever the business, the industrial desideratum is public service. Although the chance to secure a substantial surplus is what leads the business man to risk his capital in new adventures, his sole thought is not business in terms of salary and profit. Less is heard of the "right" of the business man to run his business as he pleases, irrespective of any social purpose to be fulfilled. This is the message of Edgar Heermance in his presentation of the evolution of business ethics. He sees business today on safe ground after years of encounters with the storms of competition, commercial dishonesty, base advertising and credit inflation. The tempests were all weathered through the influence of the American Trade Association, an organization of employers. Out of the efforts of the association merged a changed philosophy on fair competition, fair profit, credit and contracts. The change from misleading and fraudulent advertising to the truth movement, started by A. T. Stewart and advocated later by John Wanamaker, was welcomed in an era when the need for house cleaning in the advertising profession was very evident. Several pages are devoted to outdoor advertising industry, in which the author has little tolerance for an indifference toward beauty of display. He considers good will the greatest asset in business. It is not a dutiful ideal, but rather a Utopian one.

In relations between competitors is seen the emergence of a great ethical principle, commonly called co-operation. Mr. Heermance prefers to call it the principle of common interest. He says when men in the same line of trade recognize that they have a common interest, and act accordingly, with due regard for the rights of the public, their relations become to that extent more normal, harmonious and productive.

In addition to his theories on the evolution of standards in business, the writer has recorded attempts made to improve codes in American industries. Witness an example of this in the code of electric railway associations and other utilities, which maintains that "a business that is legally protected against competition should be ever conscious of its ethical duty, untiringly vigilant in the protection of its good name, generously just in meeting its every obligation."

Whatever the achievement of business ethics, one feels more convinced than ever, after reading Mr. Heermance's book, that the idea of "every man for himself" suffered defeat by its own tactics and that the more satisfying and lasting philosophy "for the good of the people" is rewarded, and in the present world, too.

The book really is intended as an introduction to the study of social ethics, "ethics considered consistently from the social point of view." The student of sociology will find in the book much food for speculative thought. The casual reader will find the book full of interesting and revelatory data on methods in promulgating standards.

Personal Items

W. J. Harvie Resigns

Well Known Official Retires from New York State Road—Succeeded by L. E. Lippitt

William J. Harvie has resigned as general manager of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., and Lawrence E. Lippitt has been named as his successor by Talmadge C. Cherry, president of the road.

Mr. Harvie served as vice-president and general manager of the system for the past eight years. He retires because of ill health. Mr. Lippitt has been auditor and treasurer of the company for ten years. Mr. Harvie also resigned as vice-president of the Mid-State Coach Lines, motor bus subsidiary of the Auburn & Syracuse Railroad, and severed all connections with the industry, for the time being, in an effort to rebuild his health. He has left with a party of Auburn business men on a trip to upper Canada.

Nearly all of Mr. Harvie's electric railway work has been done with railways in central New York. He was born in Buffalo, N. Y. After receiving his high school education in that city he was employed in the operating offices of the Western Union Telegraph Company. He attended the Syracuse University, from which he was graduated in 1899 with the degree of electrical engineer. Previous to the year of his graduation from the university he had entered the electric railway industry in the overhead department of the Syracuse Rapid Transit Railway.

The latter part of 1900 Mr. Harvie was employed by the Syracuse, Lake Shore & Baldwinsville Railway, in various capacities in the car shops and power house. In 1901 he became connected with the Syracuse & Suburban Railroad as electrical engineer in charge of its power plant, car equipment and overhead lines.

In the fall of 1901 he became associated with the Andrews-Vanderbilt syndicate in charge of the construction work in Oneida for the Oneida Railway and also in charge of the overhead construction of the Little Falls extension of the Utica & Mohawk Valley Railway. In 1902 he was appointed electrical engineer of the Utica & Mohawk Valley Railway in charge of its power installation. This comprised one of the first 20,000-volt transmission lines with substations operated in the East. Later he was given charge of the mechanical department, being responsible for the operation of car shops located in Utica, Mohawk and Rome.

During 1905 and 1906 and the early part of 1907 the West Shore Railroad between Utica and Syracuse was electrified under Mr. Harvie's direct supervision, the construction being the "under-running third-rail type," which was one of the first installations of its kind in this country. Mr. Harvie was appointed chief engineer of the Syracuse Rapid Transit Railway and Oneida



W. J. Harvie

Railway in 1908, retaining his supervision over the Utica properties.

Mr. Harvie was elected president of the New York State Electric Railway Association at the meeting at Bluff Point in 1925. He has always taken great interest in the work of the New York association and also of the national associations, particularly of the American Electric Railway Engineering Association, of which he was president in 1910-11. He has also served on a number of committees of the American Electric Railway Association.

E. K. Miles Promoted at Syracuse

E. K. Miles has succeeded the late John Duffy as superintendent of transportation of the Syracuse, N. Y., lines of the New York State Railways. Mr. Miles was appointed by B. E. Tilton, vice-president and general manager. The new appointee had been assisting Mr. Duffy for some time, and during the latter's illness had practically taken over the entire work. The title of superintendent of transportation is a new one in the company and eliminates that of general superintendent, which Mr. Duffy had as supervisory official of both the Utica and Syracuse lines.



E. K. Miles

Mr. Miles became associated with the New York State Railways in 1908 as a motorman. He served in this capacity for eight years and then for two years he worked as a railway mail clerk. In December, 1918, he returned to the service of the New York State Railways as motorman instructor and four years ago he was made division superintendent in charge of the runs from the Tallman Street carhouse. Early this year Mr. Miles was appointed assistant to the general superintendent. It was at that time that F. Raymond Latta, then holding the position of assistant, resigned. Mr. Miles was considered a good choice for the responsibilities of this work. From the standpoint of experience he was well equipped in the fundamentals of the transportation department and his years of apprenticeship on the cars and as division superintendent gave him an understanding of all the necessary elements.

W. Kesley Schoepf Testimonial in Book Form

Permanent remembrance of the banquet given to veteran employees of the Cincinnati Traction Company, Cincinnati, Ohio, on Oct. 28 last by W. Kesley Schoepf, who retired as president after a quarter century of service, has been made in a book edited and published under the auspices of the Optimists Club and the Queen City Club of Cincinnati.

The address of Mr. Schoepf, which is printed in full, gives an insight into his character which is known only to his intimate associates. Loyalty to the men who had worked for the company during the period of his connection with it was an outstanding characteristic.

The volume also contains the other addresses made at the banquet, a list of the 454 men who received gold watches as a token of Mr. Schoepf's esteem and many letters of felicitation sent to him by his associates and employees. All of these breathe a spirit of the friendship and esteem in which he was held.

The book also contains several photographs of Mr. Schoepf, of the gifts which were bestowed by him and on him, and reproductions of pages from the album presented by the employees and bearing their signatures. It has a total of about 150 pages.

J. F. Egolf Goes to Chicago

John F. Egolf, general manager of the Aurora, Elgin & Fox River Electric Railway, Aurora, Ill., has become assistant to the vice-president of the Chicago Rapid Transit Company, Chicago, Ill. Mr. Egolf is well known in the railway field for the metamorphosis he effected in Aurora, steering that property out of a financial storm to a comparative calm. Also he is prominent for his activities as president of the Illinois Electric Railway Association.

He served as conductor on the Columbus Street Railway from 1898 to 1902, and then in the mechanical department of that company as a car repair man. In 1903 he went with the Columbus, Buckeye Lake & Newark Railway as a motorman, and again

served for two years on the platform, after which he was transferred to the dispatcher's office. This company was later absorbed by the Ohio Electric Railway, whereupon Mr. Egolf was sent to Springfield, Ohio, as chief dispatcher. In 1907 he was appointed assistant superintendent.

As varied as was his career up to that date, it didn't in any way exhaust his possibilities. He became dispatcher and chief dispatcher with the Chicago, Lake Shore & South Bend Railroad, was manager of the Springfield & Xenia Railway and later became affiliated with the Interurban Railway & Terminal Company, where he had charge of all operations until 1922.

In that year he became general manager for the receiver of the Fox River

division of the Aurora, Elgin & Chicago Railroad. This property was subsequently purchased by the Western United Corporation and early in 1925 Stone & Webster were engaged to operate it along with all the other subsidiaries of the Western United Corporation. Throughout these changes Mr. Egolf has been retained as general manager, having charge in that capacity of all the railway properties of the Aurora, Elgin & Fox River company.

Besides his natural inclination for work Mr. Egolf was gifted with special intuitive powers to understand men and their viewpoint. This idea, which made him regard his platform men as transportation salesmen, contributed in good measure to the development of the Fox River property.

A. W. Thompson Heads U. G. I.

**Pittsburgh Railways Head, Under Whom Coffin Award Was Won,
Selected to Succeed S. T. Bodine with Immense Holding
Company—Assumes New Duties on Sept. 1**

ARTHUR W. THOMPSON, Pittsburgh, was elected president of the United Gas Improvement Company, Philadelphia, on July 20. He succeeds Samuel T. Bodine, who was elevated to the newly created post of chairman of the board of directors. Mr. Thompson is president of the Philadelphia Company, which operates all of the utility companies in the Pittsburgh district. He is closely associated with the Mellon banking interests of that city and he also is a director of the Pennsylvania Railroad. He will assume his new office on Sept. 1. It was the Pittsburgh Railways, of which he is the head, that won the Coffin award last year and it was Mr. Thompson who personally accepted the award at Atlantic City in behalf of the company, its employees and the city.

In a statement Mr. Bodine said:

It gives me great pleasure to announce the fact that I have succeeded in my efforts further to strengthen the organization of our company by obtaining the services of Arthur W. Thompson and that my recommendation has been unanimously approved by the board of directors and made effective by my election as chairman of the board of directors and Mr. Thompson's election as president, both elections becoming effective on Sept. 1, 1926.

Mr. Thompson is at present and has been for a number of years president of the Philadelphia Company and of its various subsidiaries which operate the gas, electric and transportation utilities of Pittsburgh, including the Duquesne Light Company, whose electric plant is confessedly one of the most efficient in the United States. He is in the prime of life and is one of the recognizedly successful leaders in the public utility field.

As chairman of the board of directors Mr. Bodine will continue to serve the shareholders as actively as in the past and with the same authority in shaping and directing the policies of the company.

The United Gas Improvement Company is a large operator of public utility properties, especially electric light plants outside of Philadelphia. It has a large interest in the Public Service Corporation of New Jersey. Many moves regarded as especially

significant have been made recently in its affairs and the affairs of the companies affiliated with it. Among them these changes have been noted:

Retirement of the outstanding preferred stocks by both the United Gas



A. W. Thompson

Improvement Company and the Philadelphia Electric Company.

A financial readjustment plan of the Public Service Corporation's gas and electric companies' holdings.

A plan for the readjustment of the capital structure of Public Service railway holdings, with the possibility that a new company will be organized, thus eliminating railway operations from any merger plan of the future.

Election of Thomas S. Gates of Drexel & Company to the board of directors of the Public Service Corporation of New Jersey.

Election of Thomas N. McCarter, president of the Public Service Corporation of New Jersey, to the board of directors of the United Gas Improvement Company.

Election of Edward Hopkinson, Jr., one of the best-known banking and public utility lawyers in Philadelphia, to membership in the firm of Drexel & Company.

Edward T. Statesbury, senior mem-

ber of Drexel & Company, is a director of the United Gas Improvement Company. Horatio G. Lloyd, another member of the Drexel firm, is on the board of the Philadelphia Electric Company. Drexel & Company are recognized as the bankers of the United Gas Improvement Company, the Philadelphia Electric Company and the Public Service Corporation of New Jersey.

Mr. Thompson, the new president of the United Gas Improvement Company, was born in Erie on May 8, 1875. He was graduated from Allegheny College, Meadville, in 1897 with a degree of C.E.

While still in college he began work as rodman on location with the Pittsburgh, Bessemer & Lake Erie Railroad. Shortly after his graduation he joined the Baltimore & Ohio Railroad's engineering staff as chief of a party of surveyors. In his eighteen years service with that system he rose to be third vice-president in charge of traffic and commercial development.

On June 1, 1918, he was made federal manager by the United States Railroad Administration of several large Eastern railroads. He became president of the Philadelphia Company in February, 1919. Since that time he has made considerable progress in building up the varied properties of the company, especially the railway system.

On July 2 Mr. Thompson announced his resignation to the public of Pittsburgh. In leaving Pittsburgh Mr. Thompson said he would retain his position in the board of directors of the Union Trust Company, Pittsburgh and other directorates not subsidiary to the Philadelphia Company. He has not resigned his place on the directorate of the Pittsburgh Chamber of Commerce and other civic organizations. His large personal staff brought by him from Baltimore seven years ago, he said, probably would remain with the Philadelphia Company, only two or three secretaries going with him.

Obituary

W. S. Hamilton

William S. Hamilton, Rochester, supervisor of stores for the New York State Railways, Rochester, Syracuse and Utica Divisions, and brother of James F. Hamilton, president of the company, died on June 25 at the Syracuse General Hospital after an illness of ten weeks. He was 56 years old. As noted briefly in the JOURNAL for July 3 Mr. Hamilton was stricken with apoplexy while on a business trip to Syracuse. Born in Birdsall, N. Y., he entered electric railway work at an early age. For twenty years prior to his going to Rochester he lived in Schenectady, where at one time he was superintendent of the Schenectady Railway, but not president, as incorrectly stated in a previous item. His early railway work was with the Buffalo Railway, now the International Railway. He left this company about 1905 to become station master with the Schenectady Railway. He remained with this company for about twenty years, being appointed in 1916 superintendent of transportation and in 1920 general superintendent.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Importance of Industrial Advertising Recognized

Harvard Award of \$2,000 Will Be Made for Best Campaign of Year Conducted in Industrial Journals

An award of \$2,000 will be given for the first time this year, as a part of the Harvard Advertising Awards, for the advertising campaign of the year coming under the consideration of the jury of award as the campaign most conspicuous for the excellence of its planning and execution which seeks publicity for industrial products primarily through the media of industrial, trade or professional journals.

Industrial products seeking publicity through general popular magazines may compete for the award of \$2,000 given for the best national campaign, either of an institutional character or devoted to the advertising of specific products. Four prizes of \$1,000 each are offered for individual advertisements most effective in use of text, most effective in pictorial illustration, in combination of both, and in typography.

A gold medal is awarded annually to the individual or organization deemed by the jury of award to merit recognition for distinguished contemporary services to advertising. The Harvard Advertising Awards were founded by Edward W. Bok in 1923 and are administered by the Harvard Business School. Awards are made annually, and advertising material to be considered for the current year must be received by the secretary of the Harvard Business School on or before Dec. 31, 1926. The jury, the personnel of which will be announced later, will make the awards early in January.

Railway Utility Ventilators Specified

Ventilators on the ten new cars being built for the New York, Westchester and Boston Railway by the Pressed Steel Car Company will be supplied by the Railway Utility Company of Chicago, Ill. These ventilators are similar in all respects to those which were specified on the ten cars which constituted a preceding order made some time ago by the suburban line. Specifications on the most recent cars were published in the issue of *ELECTRIC RAILWAY JOURNAL* for June 26, page 1130.

St. Louis Increases Car Building Facilities

Construction work has been started by the St. Louis Car Company on two new buildings for its plant group located at 8000 N. Broadway, St. Louis, Mo. The buildings will be used for

steel fabricating and for the erection of cars. The main unit will be 1,000 ft. in length and 130 ft. in width and equipped with four 10-ton cranes, 60 ft. in span. Light steel materials will be housed in the second building, which is to be 100 ft. in length and 60 ft. in width. This building will be attached to a 250-ft. crane runway steel yard equipped with a 60-ft., 10-ton crane.

Cleveland Convention Exhibit to Be Best Ever

Applications for exhibit space have far exceeded the expectations of the American Railway Association, as revealed at the meeting of the exhibit committee held in Cleveland on July 8. A 180-ft. extension to the new building was decided on to care for this surplus.

The assignment, including 193 exhibitors, has been practically completed for 108,101 sq.ft. of space exclusive of any outdoor exhibits. This far exceeds the requests in any past year at this time. In addition to the above there were ten requests for outside track space which total approximately 800 lin.ft. of trackage.

Last year the overflow from the Million Dollar Pier in Atlantic City had to be cared for in a somewhat unsatisfactory tent annex. This year adequate accommodations will be available in an extension of the west wing of the auditorium, decided upon as a result of the July 8 meeting.

The new building will be of steel and stucco construction, having a minimum headroom of 18 ft. Adequate lighting, both natural and artificial, with the wide aisles and interior decorations planned, will make this a most attractive exhibit space. A solid tongued-and-grooved floor will be used in the new building instead of the barberton gravel flooring originally planned.

This building will be 600 ft. long, extending the full length from St. Clair Avenue to Lakeside Avenue. It will be 200 ft. wide for the portion originally planned and 100 ft. wide for the extension which was decided on. While new drawings are being made showing this extension the original layout is not materially changed, except that the entire new structure will be moved westward and the track areas placed between the present and the new auditoriums.

An extensive pergola or arbor, covered with striped awnings with growing vines at the side, will connect the two buildings. The track exhibit will be on the south of the pergola and the track maintenance exhibits under the awning and arbor connecting the two buildings with a garden on the north side of the pergola.

A great drive is being made for a large exhibit of cars to be placed in the track space between the two buildings.

With many requests for such space now on hand and several promises recently received from operators as well as manufacturers, it appears that this will be a truly representative exhibit of modern car development, including both urban and interurban types.

The auditorium proper has two floors. The arena is known as section A and the exhibition hall is known as section B. The new building to be erected is section C, and the D section is the open-air space between the two buildings under the pergola and section E is the track space.

The committee meeting was well attended and the spectacular plans developed by the local Cleveland committee were received with approbation. Those who attended the exhibit meeting and space assignment were: J. H. Alexander, chairman; C. H. Clark, S. J. Cotsworth, John A. Dewhurst representing Charles Gordon, H. Fort Flowers, B. A. Hegeman, Jr., R. Roy Holden, A. L. Kippenberger, J. R. McFarlin, J. C. McQuiston, A. Frank Paul, A. L. Price, A. M. Robinson, James W. Welsh, Fred B. Bullock, assistant to Colonel Alexander; Fred C. J. Dell, director of exhibits, and Thomas J. Segrave, assistant to Mr. Dell.

Haskelite Adds Publishing to Its Other Functions

During the past month a new publication has spread its wings in the air. To the newcomer in the field of house organs has been given the name *Light Weight Champion's Record*, the suitability of this title being easily recognized when it is learned that it is being published by the Haskelite Manufacturing Corporation of Chicago. It is planned to fill the little paper, a 9x12-in. leaflet, with interesting news of the 101 applications for Haskelite and Plymetl, covering all of the industrial fields. As an example of the manner in which this policy will be carried out, the first issue contains brief, pithy notes on the manner in which these lightweight materials have been adapted to street cars, buses, commercial cars, signs and airplanes in various sections of the country.

Powerful Locomotives for the Pennsylvania

Seven of the most powerful electric locomotives ever built are to be constructed by the Pennsylvania Railroad in its shops in Altoona, Pa. The contract for the equipment has been let to the American Brown Boveri Electric Corporation. Each locomotive will have four driving motors with a combined capacity of 3,640 hp., a driving axle load of 75,000 lb. and 80-in. driving wheels. They will be usable either as high-speed passenger locomotives or for pulling the heaviest freight. As freight locomotives they will be able to haul 100 loaded cars at 35 m.p.h., it is said.

It is planned to use the seven new locomotives to replace smaller electric engines now employed in the service between Manhattan Transfer and New York City. Later they may be used on the main line between Philadelphia and Wilmington when that stretch has been completely electrified.

Final Delivery of Little Rock Cars Will Soon Be Made



Work on the 30 single-truck, single-end, one-man safety cars ordered by the Arkansas Central Power Company, Little Rock, Ark., is being rapidly pushed to completion by the American Car Company, St. Louis, Mo. As noted in the issue of *ELECTRIC RAILWAY JOURNAL* for June 19 delivery has already been made of six of the new units. The cars will seat 33 passengers and are of all-steel construction. Advertising slogans or message signs are painted on both sides of each car. Public interest has reached quite a high point in Little Rock over this equipment. Specifications follow:

Length over all 28 ft. 6½ in.
Truck wheelbase 8 ft. 0 in.
Width over all 8 ft. 3 in.
Height, rail to trolley base 10 ft. 5 in.
Body All steel
Interior trim Birch, natural wood finished
Headlining ¾-in. Agasote, with Celotex insulation
Roof Arch
Air brakes General Electric
Axles Brill
Bumpers Channel with automobile type
New Era Spring & Specialty Co. bumper
Car signal system Faraday

Car trimmings Polished bronze
Center and side bearings Brill
Compressors CP-25
Control K-63
Curtain fixtures Rex, National Lock Washer Co.
Curtain material Pantasote Pat. J-86, morocco
Destination signs Hunter illuminated
Door-operating mechanism National Pneumatic
Fare boxes Johnson
Fenders HB
Finish Duco
Gears and pinions General Electric
Hand brakes Brill vertical type
Heater equipment Consolidated Car Heating Co. truss plank
Headlights Golden-Glow SM-95
Journal bearings Friction
Journal boxes Brill
Lightning arresters General Electric
Motors Two GE-264-A, inside hung
Sanders Ohio Brass
Sash fixtures Dayton
Seats Brill 105-A, modified
Seating material Chase's X grade plush gray
Springs Brill
Step treads Kass
Trolley catchers Ohio Brass No. 13141
Trolley base General Electric
Trolley wheels General Electric
Trucks Brill 79-E with special solid forged side frame
Ventilators Brill exhaust
Wheels Southern Car Wheel Co., 26-in.



Unusual Attention Has Been Given to Riding Comfort in Designing the Seats for These Little Rock Cars

Southern Properties Will Soon Receive 33 Light-Weight Cars

Delivery is expected to be made on July 25 of the ten cars recently ordered from the Light Weight Noiseless Electric Street Car Company, Chicago, Ill., by the Tennessee Electric Power Company of Chattanooga, Tenn. This company, one of three Hodenpyl-Hardy properties in the South which have placed similar orders for equipment, plans to place the new units in immediate service following delivery and the necessary testing. Ten cars of the same type will be delivered to the Nashville Railway & Light Company, Nashville, Tenn., about Aug. 15 and thirteen more, also of the same construction, to the Southern Indiana Gas & Electric Company, Evansville, Ind., about Sept. 1. The order for this rolling stock was placed on April 23, 1926. The cars will be for one-man, two-man operation and will have a seating capacity of 44.

Dimensions of the cars in the individual orders are not quite similar, nor is the brake equipment on the several cars. The ten Tennessee Electric Power cars are 8 ft. 6 in. wide and 40 ft. 3½ in. long. The Nashville cars are 8 ft. 2 in. wide and 39 ft. 6 in. long. The Southern Indiana units are 8 ft. 6 in. wide and 37 ft. 9 in. long. The cars in the first-named order are equipped with Westinghouse air brakes and DH-16 compressors. All of the other cars have Westinghouse brakes and CP-27 compressors. Safety Car Devices equipment is used throughout. Specifications follow:

Weights:
Car body 10,000 lb.
Trucks 7,000 lb.
Equipment 10,500 lb.
Total 27,500 lb.
Bolster centers, length 19 ft. 6 in.
Length over all 40 ft. 0 in.
Truck wheelbase 4 ft. 6 in.
Width over all 8 ft. 6 in.
Height, rail to trolley base 10 ft. 1 in.
Body Steel frame, Haskellite covered
Interior trim Mahogany
Headlining Haskellite
Roof Arch
Armature bearings SKF roller
Axles Lightweight Noiseless Co.
Bumpers Car builders' standard
Car signal system Faraday high tension
Car trimmings Car builders' standard
Center and side bearings Car builders' standard
Compressors Westinghouse DH-16;
General Electric CP-27
Control K-75
Couplers Lightweight Noiseless Co.
Curtain fixtures National Lock Washer
Curtain material Pantasote 85-77
Destination signs Hunter illuminated
Door-operating mechanism Consolidated Car Heating Co.
Fare boxes Johnson Car Box Co.
Fenders Car builders' standard
Gears and pinions G. E. noiseless type
Hand brakes Pittsburgh, drop handle
Heater equipment Consolidated Car Heating Co.
Headlights Golden Glow
Journal bearings Hyatt roller
Journal boxes Lightweight Noiseless Co.
Lightning arresters G. E. aluminum cell
Motors Four GE-258 K, inside hung
Finish Enamel
Sanders Car builders' standard
Sash fixtures Car builders' standard
Seats Hale & Kilbourn, Walkover type
Seating material Kemi-Suede
Springs Car builders' standard
Step treads Kass safety tread
Trolley catchers Ohio Brass and Keystone
Trolley base Ohio Brass
Trolley wheels Moore-Jones, 4 in. 5 in.
Trucks:
Smith No. 12, light weight, roller bearing
Ventilators Car builders' standard
Wheels 26-in. rolled steel
Special devices, etc.:
Economy meters, exit treadle step control,
Sangamo economy power meters used on
Tennessee Power Company and Nashville cars.

Babbitt Consumption Falls Off

A decrease in the total consumption of Babbitt metal for the month of May was noted over the preceding month and also over May, 1925. Calculations made by the Department of Commerce from reports received from 27 firms

	Total (Apparent Consumption), Lb.	Sales (By Manu- facturers), Lb.	Consumption (By Producers), Lb.
1925			
January.....	5,683,183	4,620,815	1,062,368
February.....	5,164,619	4,103,340	1,061,279
March.....	5,644,288	4,395,901	1,248,387
April.....	5,126,416	3,928,136	1,198,280
May.....	5,081,668	4,189,558	892,110
Total (five months).....	26,700,174	21,237,750	5,462,424
June.....	5,074,966	4,085,125	989,841
July.....	5,184,196	3,694,386	1,489,810
August.....	5,441,823	4,068,706	1,373,117
September.....	4,621,033	3,579,780	1,041,253
October.....	5,550,247	4,169,870	1,380,377
November.....	4,954,683	3,534,026	1,420,657
December.....	4,878,806	3,910,160	968,646
Total.....	62,405,928	48,279,803	14,126,125
1926			
January.....	5,152,694	3,708,383	1,444,311
February.....	5,139,952	3,867,710	1,272,242
March.....	5,860,543	4,852,805	1,007,738
April.....	5,229,199	3,817,253	1,411,946
May.....	4,797,038	3,640,369	1,156,669
Total (five months).....	26,179,426	19,886,520	6,292,906

showed the total apparent consumption to be 4,797,038 lb., as compared with 5,229,199 in April and 5,081,668 in May, 1926. The consumption is calculated from sales by manufacturers and consumption by such firms as consume their own production. The accompanying table shows the sales of the metal as separated from the consumption in the producing plants.

Kawasaki Builds Freight Locomotives in Japan

Last year the South Manchurian Railway ordered three 173-ton electric locomotives for transporting coal from the Fushun Colliery. Contracts for these locomotives were awarded to the Kawasaki Dock Yard Company, Kobe, Japan. All mechanical and electrical equipment was designed and built by the Kawasaki company.

The locomotives have recently been shipped to Fushun and are now in service there. They have a one-hour rating of 1,200 hp. at 1,200 volts d.c. Four 300-hp. motors, with a 17:89 gear ratio, are provided on each locomotive. The wheel arrangement is 0-4-4-0 and

the trucks are of the swivel, center cab type. Multiple-unit control is provided on each of the three units. The locomotives are capable of hauling 1,150 tons over a level profile at a speed of 15 m.p.h. and have a rate of acceleration of 0.215 ft. sec.² They have a maximum tractive effort of 40,200 lb. and a maximum speed of 40 km. per hour or approximately 25 m.p.h.

The three units have a high-speed breaker each, Westinghouse EL-14 air brakes, two motor blowers, one motor-generator and two motor air compressors.

Following are some of the principal dimensions of the locomotives: Length over all 13,590 mm., or 30 ft. 5½ in.; gage of track, 1,435 mm., or 56½ in.; width over all, 3,000 mm., or 9 ft., 10½ in.; height over all 3,700 mm., or 12 ft. 1½ in.; diameter of wheel, 1,250 mm., or 4 ft. 1½ in. Weights—Mechanical equipment, 48 tons; electrical equipment, 25 tons; total weight on driver, 73 tons.

Rolling Stock

Hamilton Street Railway, Hamilton, Ont., in accordance with its new agreement plans to spend \$1,250,000 during the next three years for new cars, buses and carhouses.

Johnstown Traction Company, Johnstown, Pa., has just received two new submarine type cars, costing approximately \$10,000 each, for use in city service. These cars are exact duplicates of the units which were procured several months ago.

Minneapolis Street Railway, Minneapolis, Minn., has signed a \$125,000 contract for the construction of ten gas-electric motor buses, which will be used to start the first bus service through the loop and residential districts of the city. The new service will be initiated as supplementary to the street car service in September, according to T. Julian McGill, vice-president of the company in charge of operations. The buses, which will be operated by the Twin City Motor Bus Company, the bus operating subsidiary, will be of the type now in use at Buffalo, N. Y., and Philadelphia.

Track and Line

Johnstown Traction Company, Johnstown, Pa., is laying new rails on the inbound track on Franklin Street. Rails on the outbound tracks are to be laid later from Main Street to Fockler's Corner.

Boston Elevated Railway, Boston, Mass., plans to cut through the wall on the outbound side of the Kendall Station in the Cambridge subway, and when permission is granted by the Public Utilities Commission will construct an underground passage to the surface. This improvement will serve as a convenient route for the transfer of passengers from the subway to buses.

Pacific Northwest Traction Company, Seattle, Wash., following the approval of an ordinance is permitted to lay double track along Stewart Street from Eighth to Ninth Avenues, at the

site of the proposed new \$500,000 interurban and bus station. The action is a formal step in the plans for the new terminal planned by the traction company, which is a subsidiary of the Puget Sound Power & Light Company. The interurban terminal was referred to in the *ELECTRIC RAILWAY JOURNAL* issue of March 20, page 524.

Trade Notes

B. M. Horter, formerly of the Philadelphia office of the Cutler-Hammer Manufacturing Company, has just been appointed manager of the company's Boston office. He succeeds J. M. Fernald, who has resigned.

G. C. Kuhlman Car Company, Cleveland, Ohio, a subsidiary of the J. G. Brill Company, at a meeting of the board of directors on June 23 elected Harry K. Hauck, general manager, a vice-president to succeed J. W. Rawle, resigned. R. H. Watts, who has been secretary and assistant treasurer, resigned the latter office and was elected assistant to vice-president in addition to his office as secretary. T. B. Richardson succeeds Mr. Watts as assistant treasurer. Mr. Hauck joined the Kuhlman organization in June, 1919. Before that he was affiliated with the Carnegie Steel Company and the Bethlehem Steel Corporation. He was graduated from Lafayette College, in Easton, Pa., his native city.

New Advertising Literature

Ohio Brass Company, Mansfield, Ohio, has issued a leaflet reprinted from the May 8, 1926, issue of the *Electrical World*, telling how every 25 seconds another O. B. suspension unit joins its fellow units doing their part in preserving continuity of the world's power supply.

General Electric Company, Schenectady, N. Y., has issued Bulletin G.E.A.-319, describing separable post type insulators for use on outdoor switching installations handling from 88,000 to 220,000 volts.

Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio, is distributing a unique little folder exploiting the merits of Kemi-Suede, the new material which is being specified for roofing, flooring, upholstering and curtains for electric traction cars, buses and taxicabs. A cut-out effect shows a swatch of Kemi-Suede over which the reader is asked to rub his thumb as he picks up the unusual folder. Inside is found the pasted-on swatch, together with a brief story about this waterproof material. On the back of the folder is shown a complete list of representatives of the company, as follows: Grayson Railway Supply Company, 600 LaSalle Building, St. Louis; Sisson Supply Company, 1845 Grand Central Terminal, New York; Wolverine Supply Company, 8242 Woodward Avenue, Detroit; J. P. Armstrong, Balboa Building, San Francisco; Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver, Canada; Parker, Peebles & Knox, Inc., 44 Whitehall Street, New York, for export.

Metal, Coal and Material Prices

Metals—New York	July 6, 1926
Copper, electrolytic, cents per lb.....	13.875
Copper wire, cents per lb.....	16.00
Lead, cents per lb.....	8.275
Zinc, cents per lb.....	7.57
Tin, Straits, cents per lb.....	62.375
Bituminous Coal f.o.b. Mines	
Stokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....	\$4.425
Somerset mine run, Boston, net tons.....	1.95
Pittsburgh mine run, Pittsburgh, net tons.....	1.75
Franklin, Ill., screenings, Chicago, net tons.....	1.825
Central, Ill., screenings, Chicago, net tons.....	1.50
Kansas screenings, Kansas City, net tons.....	2.425

Materials

Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....	\$6.25
Weatherproof wire base, N. Y., cents per lb.....	18.00
Cement, Chicago net prices, without bags.....	2.10
Lined oil (5-bbl. lots), N. Y., cents per lb.....	11.80
White lead in oil (100-lb. keg), N. Y., cents per lb.....	15.00
Turpentine (bbl. lots), N. Y., per gal.....	\$0.88



Atlanta's progressive program calls for Peacock Staffless Brakes

During 1925 the Georgia Railway and Power Company put forty new one-man cars in city service. This same company recently ordered sixty more new cars for operation in and around Atlanta, Ga. And every one is equipped with the most modern hand brakes—

Peacock Staffless Brakes

These brakes occupy minimum platform space, are simple of operation, have a demonstrated capacity for winding in 144 inches of chain, and have proved their ability to reduce installation and maintenance costs.

Send for facts and figures that bear out these statements—and for estimates on your requirements.

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The above relief map of Yellowstone National Park, showing the routes of the Yellowstone Park Transportation Company, is supplied through the courtesy of the Northern Pacific Railway Company

Nine Years on the Trails of Wonderland

Again this year, as for the past eight years, the passenger buses and special touring cars of the Yellowstone Park Transportation Company are equipped exclusively with Goodyear Tires.

The Company operates a fleet of 270 ten-passenger buses and 47 seven-passenger touring cars. These vehicles are the chief sight-seeing reliance of about one-third of all the people who visit Yellowstone National Park. Last year, 44,786 passengers toured the Park this way, on Goodyear Tires.

This is a service, given daily, rain or shine, in which the best of tires must do their best. The roads of wonderland lead to glorious sights for those who ride, but to the tires they are so much graded dirt and gravel, or, worse, the sharp obsidian rock that is volcanic glass.

Here you must have tires with the stubborn hold-fast power of gripping tread. Here you must have tires with rugged strength of bead and wall and carcass.

Here you have, performing with safety and with constantly more marked economy, Goodyear All-Weather Tread Cord Tires.

This is the kind of service that Goodyear Tires everywhere deliver.

They deliver it with all the strength of Goodyear cord construction, with all the safety and surety of Goodyear perfected design, with all the lasting, lower-cost economy and riding ease embodied in that new cord fabric—SUPERTWIST.

Goodyear Tires, and only Goodyear Tires, are made with SUPERTWIST.

For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service

BUS TIRES

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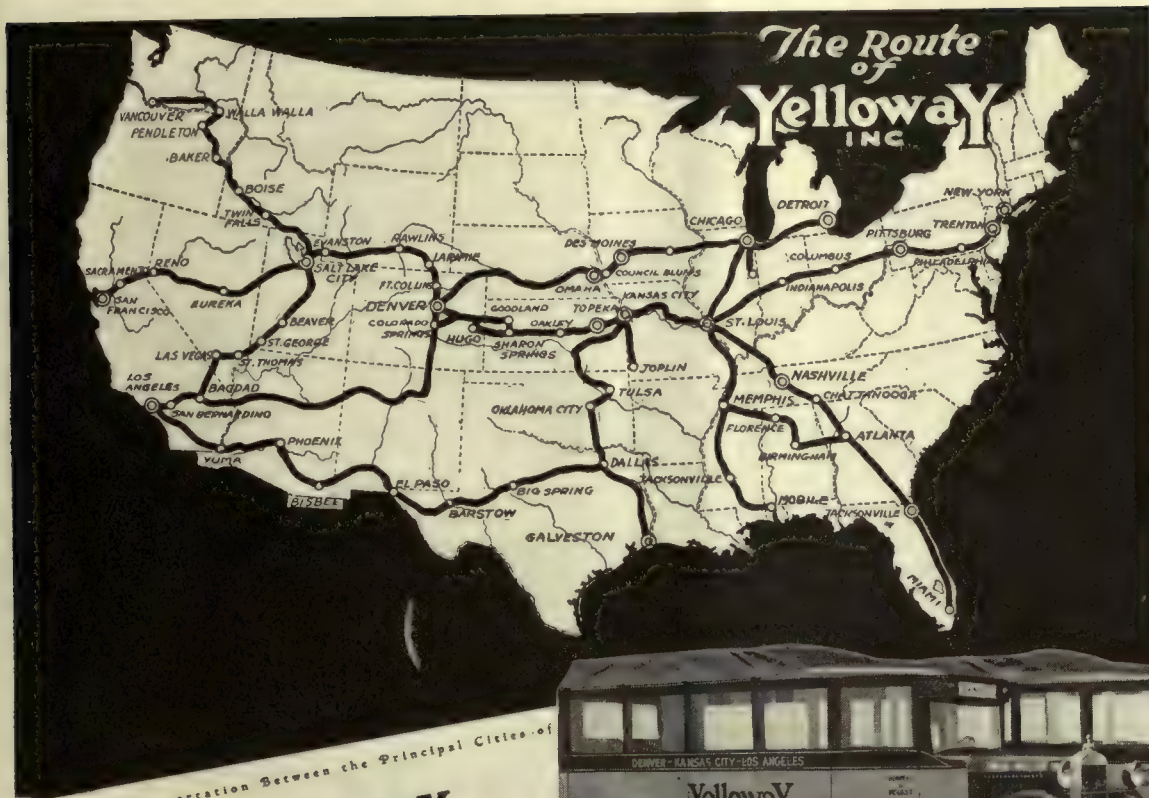
Remodeling the car barn!

If your problem is to remodel part of the car barn into a bus garage, let our engineers help. They know, by experience, what is most efficient.

Maybe your conditions require outside fueling and oil service. We have the right equipment. Maybe you would do better with your equipment inside the garage. We have that, too.

The big thing is to invite our engineers to consult with you; by doing so, you bring broad experience, exact knowledge and interested brains to your help. For further details of this without-obligation service, please address Dept. 51.

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Transportation Between the Principal Cities of

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INC.
1738 CALIFORNIA STREET
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May 5, 1926

Garford Motor Truck Co.
Lima, Ohio.

Attention Mr. F. E. Borer.

Dear Sir:

17439 Miles are now registered on my Garford Greyhound, and I can now state that the performance is 100%.

My run between Denver and Kansas City presents some very tough going for any bus, particularly during the past few weeks. We have had several trips where it was necessary to run in low and second gear at a speed of less than ten miles per hour with both axles dragging for hundreds of miles at a stretch. This has been a tremendous test for a bus and my Garford has come through in fine shape.

In spite of the very adverse conditions under which I have been operating, I am very well pleased with the low cost of operation shown by my bus. I am getting an average of 10 miles per gallon of gas. My oil is changed at each end of the run, 700 miles, and I had about a half gallon between drainings. To date I have experienced no mechanical expense.

In the light of my experience, I certainly feel that my investment in a Garford is going to prove very profitable. I have watched the performance of other buses operated by my competitors on this run and am satisfied that my bus will still be running and bringing me in a profit long after their equipment is worn out.

My only item of heavy expense has been for tires and this has been due to blow outs on rears which have no other sign of wear on the tread. My front tires are good for as much more mileage as I now have before it will be necessary to replace them.

A bus which will stand the punishment which mine has received since it was put on the run ought to last indefinitely on reasonably good roads.

Yours very truly

A. F. Shumate
A. F. Shumate

Write for the Garford
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which contains detailed
information regarding the
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Extreme Performance

No better testimony as to the stamina and dependability of the Garford Greyhounds could be asked for than the one here shown. No buses have been subjected to more severe tests than those put to the Greyhound Buses on the Yelloway route between Kansas City and Denver, where mud and mire, miles at a stretch, hindered their daily progress. But, the Garford Greyhounds, light in weight, sturdy in construction, untiring on the long run, meet schedules with clock-like regularity in all seasons—in many and various parts of the world—and at a surprisingly low cost for oil, gas and mechanical service. Greyhound Buses are setting new standards in performance for both operator and passenger.

THE GARFORD MOTOR TRUCK CO.
743 Wapak Road
Lima, Ohio

Fort Snelling - Mendota Bridge across Minnesota River near Minneapolis will contain 76,000 cubic yards of concrete. Length 4119 feet. Height, from normal low water to bridge floor, 120 feet.

Walter H. Wheeler, Designing and Consulting Engineer with the C. A. P. Turner Company Associated, prepared the plans and specifications for this job, and is also supervising the construction.



These Engineers Get Quality Concrete Using Economical Mix

QUALITY control jobs now attract attention not because there are few of them, but because there are so many. The Fort Snelling-Mendota Bridge now being built across the Minnesota River near Minneapolis is one of the outstanding examples.

Those in charge of this job are following this basic principle: Assuming a workable mix, the strength of the concrete is determined by the relation which the volume of mixing water bears to the volume of cement.

Field tests, made regularly during the progress of the work, show that predetermined strengths are being consistently obtained.

In addition, grading and proportioning of aggregates within the range of workability are giving the most economical mix and a fine, uniform texture.

Further information about field control will be gladly sent on request, if you will write the nearest office listed below. Ask for a copy of "Design and Control of Concrete Mixtures." There is no obligation.

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A National Organization to Improve and Extend the Uses of Concrete

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maintenance is greatly reduced by using real leather on seats. Leather will stand up years longer than any other covering.

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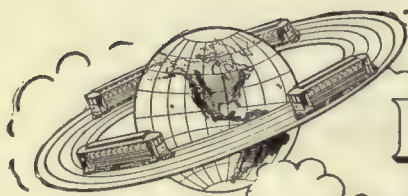
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However, he'll get more done if the pavement is vitrified brick, asphalt-filled.

Mr. A. Taurman, Superintendent Equipment, Way and Structures for the Birmingham Electric Company, Birmingham, Alabama, says:

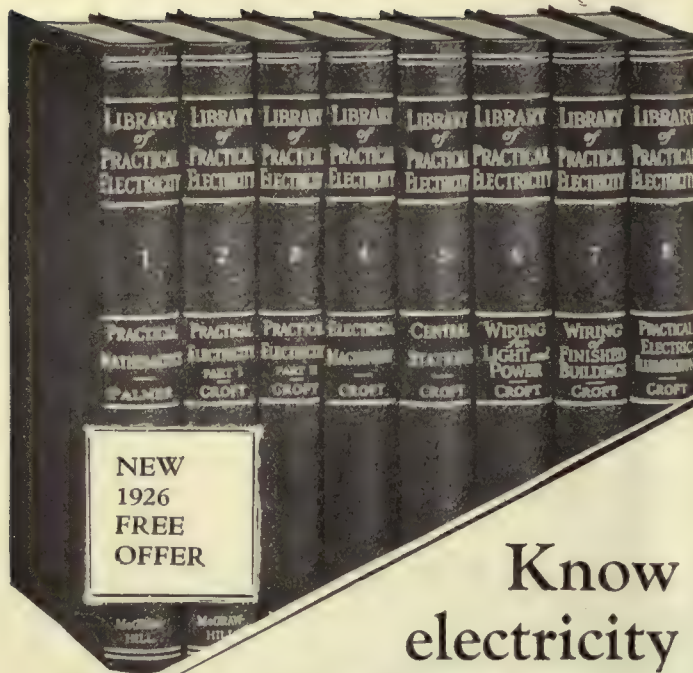
"—we have some brick paving which has out-lived one set of tracks and has been relaid practically as well as when the brick were new."

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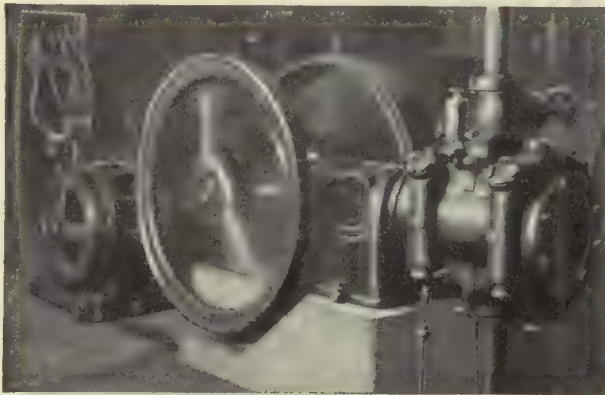
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Company

Street

City State.....



In this railway shop, the Sullivan "WG-6" Compressor supplies air by night, while the Sullivan Angle Compound Compressor in the background handles the heavier day demand.

Don't Wait for Air

Air will be waiting—always ready if your shop is equipped with a

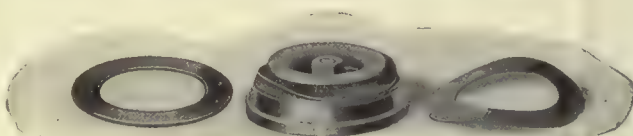
Sullivan "WG-6" Compressor
(capacity 68-1600 cubic feet)

This is no ordinary air compressor. Built into it are important features which will make your air power dependable and save you money in operation and upkeep.

Automatic lubrication, complete enclosure of working parts, "Wafer" valves and inlet plunger unloader are some of these features.

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Bulletin 3283-B.



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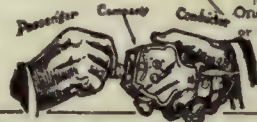
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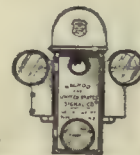
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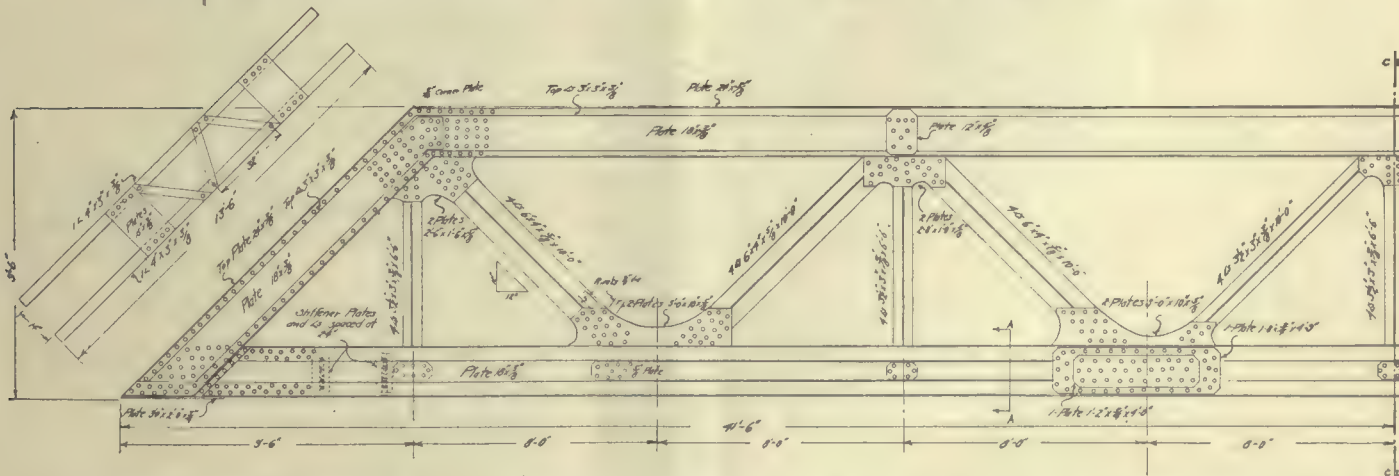
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American Brake Shoe & Foundry Co.
Brill Co., The J. G.
Brakes, Brake Systems and Brake Parts
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.
Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co., Inc.
National Carbon Co.
Westinghouse E. & M. Co.
Brushes, Graphite
Morganite Brush Co., Inc.
National Carbon Co.
Brushes, Metal Graphite
National Carbon Co.
Buildings, Steel
American Bridge Co.
Buildings, Mfg. Corp.
Haskellite Mfg. Corp.
Bunkers, Coal
American Bridge Co.
Bus seats
Hale-Kilburn Co.
Buses, Motor
Brill Co., The J. G.
Cummings Car & Coach Co.
Garford Motor Truck Co.
International Motor Co.
Mack Trucks, Inc.
Buildings, Case Hardened and Manganese
Brill Co., The J. G.
Cables, (See Wires and Cables)
Cambrie Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.
Carbon Brushes (See Brushes, Carbon)
Carbon Paste, Welding
National Carbon Co.
Carbon Plates, Welding
National Carbon Co.
Carbon Rods, Welding
National Carbon Co.
Car Lighting Fixtures
Elec. Service Supplies Co.
Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.
Car Wheels, Rolled Steel
Bethlehem Steel Co.
Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
Cars, Gas, Rail
Brill Co., The J. G.
Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.
Cars, Second Hand
Elec. Service Supplies Co.
Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.
Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Wm. Wharton, Jr. & Co.
Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.
Catenary Construction
Archbold-Brady Co.
Graybar Electric Co.
Ceiling Car
Haskellite Mfg. Corp.
Pantasote Co., Inc.
Ceilings, Plywood, Panels
Haskellite Mfg. Corp.
Cement Products
Portland Cement Association
Change Carriers
Cleveland Fare Box Co.
Elec. Service Supplies Co.
Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.
Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.
Clusters and Sockets
General Electric Co.
Coil Banding and Winding Machines
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
Colls, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.
Coin Sorting Machines
Cleveland Fare Box Co.
Coin Wrappers
Cleveland Fare Box Co.
Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.
Commutator Trailing Devices
General Electric Co.
Commutators or Parts
Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.
Compressors, Air
General Electric Co.
Graybar Electric Co.
Sullivan Machinery Co.
Westinghouse Tr. Br. Co.
Compressors, Gas
Sullivan Machinery Co.
Compressors, Portable
Sullivan Machinery Co.
Condensers
General Electric Co.
Westinghouse E. & M. Co.
Condensor Papers
Irvington Varnish & Ins. Co.
Connectors, Solderless
Westinghouse E. & M. Co.
Connectors, Trailer Car
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Controllers or Parts
General Electric Co.
Westinghouse E. & M. Co.
Controller Regulators
Elec. Service Supplies Co.
Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.
Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.
Conveying & Hoisting Machinery
American Bridge Co.
Copper Wire
American Brass Co.
Amer. Steel & Wire Co.
Anaconda Copper Mining Co.
Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.
Cord, Bell, Trolley, Register
Amer. Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebbling's Sons Co., John A.
Samson Cordage Works
Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.
Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.
Cranes, Hoists & Lifts
Elec. Service Supplies Co.
Cross Arms (See Brackets)
Crossing Foundations
International Steel Tie Co.
Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Crossings, Track (See Track Special Work)
Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.
Curtains & Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantasote Co., Inc.

Dealer's Machinery & Second Hand Equipment
Elec. Equipment Co.
Newman Co., W. J.
Dealer Second Hand Rails
Electric Equipment Co.
Derailing Devices (See also Track Work)
Derailing Switches
Ramapo Ajax Corp.
Destination Signs
Elec. Service Supplies Co.
Detective Services
Wish-Servico, P. Edward
Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heating Co.
Nat'l Pneumatic Co., Inc.
Doors & Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale-Kilburn Co.
Morton Mfg. Co.
Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.
Drills, Rock
Sullivan Machinery Co.
Drills, Track
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Dryers, Sand
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Ears
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Electric Grinders
Graybar Electric Co.
Railway Trackwork Co.
Electric Transmission Towers
American Bridge Co.
Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.
Graybar Electric Co.
John A. Roebbling's Sons Co.
Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.
Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.
Engineers, Consulting, Contracting and Operating
Allison & Co., J. S.
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layne Corp.
Bylesby & Co., H. M.
Day & Zimmermann, Inc.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLew
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.
Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.
Exterior Side Panels
Haskellite Mfg. Corp.
Fare Boxes
Cleveland Fare Box Co.
Nat'l Ry. Appliance Co.
Perry Mfg. Co.
Fare Registers
Elec. Service Supplies Co.
Fences, Woven Wire and Fence Posts
Acme Wire Co.
Amer. Steel & Wire Co.
Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.
Fibre and Fibre Tubing
Westinghouse E. & M. Co.
Field Cords (See Cables)
Flangeway Guards, Steel
W. S. Godwin Co., Inc.
Flashlights
National Carbon Co.
Flaxinum Insulators
National Railway Appliance Co.
Floodlights
Elec. Service Supplies Co.
Floor, Sub
Haskellite Mfg. Corp.
Floors
Haskellite Mfg. Corp.
Foreings
Brill Co., The J. G.
Carnegie Steel Co.
Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)
Frogs, Trolley
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Furnaces, Electric, Steel Melting
American Bridge Co.
Funnel Castings
Wm. Wharton, Jr. & Co.
Fuses and Fuse Boxes
Consolidated Car Heating Co.
General Electric Co.
Graybar Electric Co.
Westinghouse E. & M. Co.
Fuses, Refillable
General Electric Co.
Gaskets
Westinghouse Tr. Br. Co.
Gas-Electric Cars
General Electric Co.
Westinghouse E. & M. Co.
Gas Producers
Westinghouse E. & M. Co.
Gates, Car
Brill Co., The J. G.
Gauges, Oil and Water
Ohio Brass Co.
Gear Blanks
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Gear Cases
Chillingworth Mfg. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
Gears and Pinions
Bethlehem Steel Co.
Elec. Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Generating Sets, Gas-Electric
General Electric Co.
Generators
General Electric Co.
Westinghouse E. & M. Co.
Girder Rails
Bethlehem Steel Co.
Lorain Steel Co.
Gongs (See Bells and Gongs)
Greases (See Lubricants)
Grinders & Grinding Supplies
Metal & Thermit Corp.
Railway Trackwork Co.
Grinders, Portable
Railway Trackwork Co.
Grinders, Portable Electric
Railway Trackwork Co.
Grinding Bricks and Wheels
Railway Trackwork Co.
Guard Rail Clamps
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Harps, Trolley
Elec. Service Supplies Co.
Nuttall Co., R. D.
Star Brass Works
Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Headlining
Haskellite Mfg. Corp.
Pantasote Co., Inc.
Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter
Heaters, Car, Hot Air and Water
Smith Heater Co., Peter
Heaters, Car Stove
Smith Heater Co., Peter
Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.
Hoists, Portable
Sullivan Machinery Co.
Hose, Bridges
Ohio Brass Co.
Hose, Pneumatic
Westinghouse Traction Brake Co.
Instruments Measuring, Testing and Recording
Amer. Steel & Wire Co.
General Electric Co.
Graybar Electric Co.
Westinghouse E. & M. Co.

(Continued on page 42)



Pittsburgh's Power Through NCC Pyramids

IN THE Pittsburgh district, the Duquesne Light Company provides lights and power to hundreds of thousands of industrial plants and homes. It serves an area of a thousand square miles, containing 182 busy municipalities. No factor which contributes to the assurance of 100 per cent reliability has been overlooked, for interruption would mean disruption in this most active industrial district.

Both in plan and layout of their system and in the selection of their equipment, the company has taken every conceivable precaution.

A ring of power surrounds the Duquesne territory, 80 miles in circumference, consisting of a 66,000 volt transmission system. Three

widely separated power plants feed this loop from both ends, so that, should a break occur, only a single section is isolated.

National Pyramid Brushes assure unfailing commutation as their contribution to unfailing power supply. At the 13th Street plant, for example, five 2000 KW, 660 volt, 60 cycle, 450 RPM rotary converters feed the Pittsburgh Railway Company's lines. These machines are of Westinghouse make and use NCC Grade 259 on the DC end, Ringsdorff ET-10 on the AC.

Whatever your brush requirements may be, there is a National Pyramid Brush ready to give you the longest possible service and a Service Engineer ready to assist you.

National Pyramid Brushes

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, INC.
Cleveland, Ohio Carbon Sales Division San Francisco, Cal.

Canadian National Carbon Co., Limited, Toronto, Ontario

Emergency Service Plants

CHICAGO, ILL.
551 West Monroe St.
Phone: State 6092

PITTSBURGH, PA.
7th Floor, Arrott Power Bldg.
No. 3, Barker Place
Phone: Atlantic 3570

NEW YORK, N. Y.
357 West 36th St.
Phone: Lackawanna 8153

BIRMINGHAM, ALA.
1824 Ninth Ave. N.
Phone: Main 4016

- Insulating Cloth, Paper and Tape**
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite-Callender Cable Co.
United States Rubber Co.
Westinghouse E. & M. Co.
- Insulating, Silk**
Irvington Varnish & Ins. Co.
- Insulating Varnishes**
Irvington Varnish and Insulator Co.
- Insulation (See also Paints)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.
- Insulation Slots**
Irvington Varnish & Ins. Co.
- Insulator Pins**
Elec. Service Supplies Co.
Hubbard & Co.
- Insulators (See also Line Materials)**
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Interior Side Linings**
Haskelite Mfg. Corp.
- Interurban Cars (See Cars)**
- Jacks (See also Cranes, Hoists and Lifts)**
Buda Co., The
Elec. Service Supplies Co.
National Ry. Appliance Co.
- Joints, Rail (See Rail Joints)**
- Journal Boxes**
Brill Co., The J. G.
- Lamp Guards & Fixtures**
Electric Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Arc and Incandescent (See also Headlights)**
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Signal and Marker**
Electric Service Supplies Co.
Nichols-Lintern Co.
Ohio Brass Co.
- Lanterns, Classification**
Nichols-Lintern Co.
- Leather**
Cleveland Tanning Co.
- Letter Boards**
Haskelite Mfg. Corp.
- Lightning Protection**
Elec. Service Sup. Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Line Material (See also Brackets, Insulators, Wires, etc.)**
Archbold-Brady Co.
Electric Ry. Equipment Co.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Locking Spring Boxes**
Wm. Wharton, Jr. & Co.
- Locomotives, Electric**
Cummings Car & Coach Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lubricating Engineers**
Universal Lubricating Co.
- Lubricants, Oil and Grease**
Universal Lubricating Co.
- Manganese Steel Castings**
Wm. Wharton, Jr. & Co.
- Manganese Steel Guard Rails**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Manganese Steel, Special Track Work**
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.
- Manganese Steel Switches, Frogs & Crossings**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Meters (See Instruments)**
- Motor and Generator Sets**
General Electric Co.
- Motor Buses (See Buses, Motor)**
- Motors, Electric**
General Electric Co.
Westinghouse E. & M. Co.
- Motorman's Seats**
Brill Co., The J. G.
Electric Service Supplies Co.
Wood Co., Chas. N.
- Motors and Control**
Graybar Electric Co.
- Nuts and Bolts**
Bethlehem Steel Co.
Hubbard & Co.
- Oils (See Lubricants)**
- Omnibuses (See Buses, Motor)**
- Oxy-Acetylene (See Cutting Apparatus, Oxy-Acetylene)**
- Packing**
Westinghouse Traction Brake Co.
- Paints and Varnishes (Insulating)**
Electric Service Supplies Co.
Irvington Varnish & Ins. Co.
- Paints and Varnishes for Woodwork**
National Ry. Appliance Co.
Panels, Outside, Inside
Haskelite Mfg. Corp.
- Pavement Breakers**
Sullivan Machinery Co.
- Paving Guards, Steel**
W. S. Godwin Co., Inc.
- Paving Materials, Vitrified Brick**
National Paving Brick Mfgs. Asso.
- Pickup, Trolley Wire**
Elec. Service Supplies Co.
Ohio Brass Co.
- Pinion Pullers**
Elec. Service Supplies Co.
General Electric Co.
- Pins, Case Hardened, Wood and Iron**
Ohio Brass Co.
- Pinions (See Gears)**
- Pipe Fittings**
Westinghouse Tr. Brake Co.
- Planers (See Machine Tools)**
- Plates for Tee Rail Switches**
Ramapo Ajax Corp.
- Pliers, Rubber Insulated**
Elec. Service Sup. Co.
- Nat'l Ry. Appliance Co.**
- Plywood, Roofs, Headlights, Floors, Interior Panels, Bulkheads, Truss Planks**
Haskelite Mfg. Corp.
- Pole Line Hardware**
Bethlehem Steel Co.
Electric Service Supplies Co.
Ohio Brass Co.
- Pole Reinforcing**
Hubbard & Co.
- Poles, Metal Street**
Elec. Ry. Equipment Co.
Graybar Electric Co.
Hubbard & Co.
- Poles and Ties Treated**
Bell Lumber Co.
International Creosoting & Construction Co.
- Poles, Ties, Posts, Piling & Lumber**
Bell Lumber Co.
International Creosoting & Construction Co.
- Naugie Pole & Tie Co.**
- Poles, Trolley**
Bell Lumber Co.
Electric Service Supplies Co.
Nuttall Co., R. D.
- Poles, Tubular Steel**
Elec. Ry. Equipment Co.
- Electric Service Supplies Co.**
- Portable Grinders**
Buda Co., The
- Potholes**
Okonite Co.
Okonite-Callender Cable Co., Inc.
- Power Houses**
American Bridge Co.
- Power Saving Devices**
National Ry. Appliance Co.
- Pressure Regulators**
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Westinghouse Traction Brake Co.**
- Pump, Fuel and Oil**
Bowser & Co., S. F.
- Pumps, Air Lift**
Sullivan Machinery Co.
- Pumps, Vacuum**
Sullivan Machinery Co.
- Punches, Ticket**
International Register Co.
Wood Co., Chas. N.
- Rail Braces & Fastenings**
Ramapo Ajax Corp.
- Rail Filler**
Philip Carey Co., The
- Rail Grinders (See Grinders)**
- Rail Joints**
Carnegie Steel Co.
Illinois Steel Co.
Ludlum Steel Co.
- Rail Joints—Welded**
Lorain Steel Co.
- Metal & Thermit Corp.**
- Rail Welding**
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
- Rails, Relaying**
Hyman-Michaels Co.
- Rails, Steel**
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Ludlum Steel Co.
- Rail Welding**
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
- Railway Safety Switches**
Consolidated Car Heating Co.
Westinghouse E. & M. Co.
- Rattan**
Brill Co., The J. G.
Cummings Car & Coach Co.
Elec. Service Supplies Co.
Hale-Kilburn Co.
- Registers and Fittings**
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co.
Rooke Automatic Register Co.
- Reinforcement, Concrete**
American Steel & Wire Co.
Bethlehem Steel Co.
Carnegie Steel Co.
- Repair Shop Appliances (See also Coil Banding and Winding Machines)**
Elec. Service Supplies Co.
- Repair Work (See also Coils)**
General Electric Co.
Westinghouse E. & M. Co.
- Replacers, Car**
Electric Service Supplies Co.
- Resistances**
Consolidated Car Heating Co.
- Resistance, Wire and Tube**
American Steel & Wire Co.
General Electric Co.
Westinghouse E. & M. Co.
- Retrievers, Trolley (See Catchers and Retrievers, Trolley)**
- Rheostats**
General Electric Co.
Westinghouse E. & M. Co.
- Roofing, Car**
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Roofs, Car and Bus**
Haskelite Mfg. Corp.
- Sanders, Track**
Brill Co., The J. G.
Electric Service Supplies Co.
Nichols-Lintern Co.
Ohio Brass Co.
- Sash Fixtures**
St. Louis Car Co.
- Sash Fixtures, Car**
Brill Co., The J. G.
- Sash Metal Car Window**
Hale-Kilburn Co.
- Scrapers, Track (See Cleaners and Scrapers, Track)**
- Screw Drivers, Rubber Insulated**
Electric Service Supplies Co.
- Seating Materials**
Brill Co., The J. G.
Haskelite Mfg. Corp.
Pantasote Co., Inc.
- Seats, Bus**
Brill Co., The J. G.
Hale-Kilburn Co.
- Seats, Car (See also Rattan)**
Brill Co., The J. G.
Hale-Kilburn Co.
- Second Hand Equipment**
Electric Equipment Co.
- Shades, Vestibule**
Brill Co., The J. G.
- Shock Absorbers**
Cleveland Pneumatic Tool Co.
- Shovels**
Brill Co., The J. G.
Hubbard & Co.
- Shovels, Power**
Brill Co., The J. G.
- Side Bearings (See Bearings, Center and Side)**
- Signals, Car Starting**
Consolidated Car Heating Co.
Electric Service Supplies Co.
Nat'l Pneumatic Co., Inc.
- Signals, Indicating**
Nichols-Lintern Co.
- Signal Systems, Block**
Electric Service Supplies Co.
Nachod and United States
Electric Signal Co.
Wood Co., Chas. N.
- Signal Systems, Highway Crossing**
Nachod and United States
Electric Signal Co.
Wood Co., Chas. N.
- Slack Adjusters (See Brake Adjusters)**
- Slag**
Carnegie Steel Co.
- Sleeve Wheels and Cutters**
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
Nuttall Co., R. D.
- Smokestacks, Car**
Nichols-Lintern Co.
- Snow-Plows, Sweepers and Brooms**
Brill Co., The J. G.
Consolidated Car Fender Co.
Cummings Car & Coach Co.
- Soldering and Brazing Apparatus (See Welding Processes and Apparatus)**
- Special Adhesive Papers**
Irvington Varnish & Ins. Co.
- Special Trackwork**
Bethlehem Steel Co.
Lorain Steel Co.
Wm. Wharton, Jr. & Co.
- Spikes**
Amer. Steel & Wire Co.
Illinois Steel Co.
- Splicing Compounds**
Westinghouse E. & M. Co.
- Splicing Sleeves (See Clamps and Connectors)**
- Springs, Car and Truck**
American Steel Foundries
American Steel & Wire Co.
Brill Co., The J. G.
- Sprinklers, Track and Road**
Brill Co., The J. G.
Cummings Car & Coach Co.
- Steel and Steel Products**
Carnegie Steel Co.
Illinois Steel Co.
Morton Manufacturing Co.
- Steel Car Doors**
Morton Mfg. Co.
- Steel Flooring**
Morton Mfg. Co.
- Steel and Steel Products**
Illinois Steel Co.
- Steps, Car**
Brill Co., The J. G.
Morton Mfg. Co.
- Stokers, Mechanical**
Babcock & Wilcox Co.
Westinghouse E. & M. Co.
- Stop Signals**
Nichols Lintern Co.
- Storage Batteries (See Batteries, Storage)**
- Storage Tanks**
Bowser & Co., S. F.
- Strain Insulators**
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Strand**
American Steel & Wire Co.
Roebbling's Sons Co., J. A.
- Street Cars (See Cars, Passenger, Freight, Express)**
- Superheaters**
Babcock & Wilcox Co.
- Sweepers, Snow (See Snow Plows, Sweepers and Brooms)**
- Switch Stands and Fixtures**
Ramapo-Ajax Corp.
- Switches, Selector**
Nichols-Lintern Co.
- Switches and Switchboards**
Consolidated Car Heating Co.
Electric Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
- Switches, Tee Rail**
Ramapo Ajax Corp.
- Switches, Track (See Track Special Work)**
- Tampers, Tie**
Railway Trackwork Co.
- Tapes and Cloths (See Insulating Cloth, Paper and Tape)**
- Tee Rail Special Track Work**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Telephones and Parts**
Elec. Service Supplies Co.
Graybar Electric Co.
- Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)**
- Thermostats**
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Railway Utility Co.
Smith Heater Co., Peter
- Ticket Choppers and Destroyers**
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Railway Track-work Co., Philadelphia

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Gets Every Fare PEREY TURNSTILES or PASSIMETERS

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101 Park Avenue, New York City

THE BEST TRUSS PLANK ELECTRIC HEATER EVER PRODUCED



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are two of the winter problems that you must settle without delay. We can show you how to take care of both, with one equipment. Now is the time to get your cars ready for next winter. Write for details.

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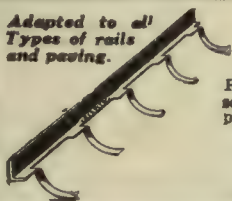
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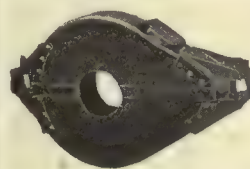
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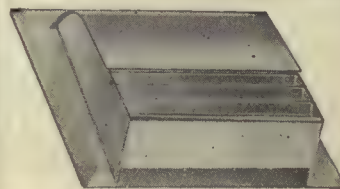
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Ventilators, Car Brill Co., The J. G. Consolidated Car Heating Co. Nat'l Ry. Appliance Co. Nichols-Lintern Co. Railway Utility Co. Vestibule Linings Haskelite Mfg. Corp. Vitrified Brick National Paving Brick Mfgs. Assn. Weatherproofing Morton Mfg. Co. Welded Rail Joints Electric Railway Improve- ment Co. Metal & Thermit Corp. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co.	Welders, Portable Electric Electric Railway Improve- ment Co. Ohio Brass Co. Railway Trackwork Co. Una Welding & Bonding Co. Westinghouse E. & M. Co. Welders, Rail Joint Ohio Brass Co. Railway Trackwork Co. Welding Processes and Apparatus Electric Railway Improve- ment Co. General Electric Co. Metal & Thermit Corp. Nat'l Ry. Appliance Co. Ohio Brass Co.	Railway Trackwork Co. Una Welding & Bonding Co. Westinghouse E. & M. Co. Welding Steel Electric Railway Improve- ment Co. Railway Trackwork Co. Una Welding & Bonding Co. Welding Wire American Steel & Wire Co General Electric Co. Railway Trackwork Co. Roebling's Sons Co., J. A. Welding Wire and Rods Railway Trackwork Co. Wheel Guards (See Fenders and Wheel Guards) Wheel Presses (See Machine Tools)	Wheels, Car, Steel & Steel Tire American Steel Foundries Carnegie Steel Co. Illinois Steel Co. Wheels, Trolley Elec. Ry. Equipment Co. Elec. Service Supplies Co. General Electric Co. Nuttall Co., R. D. Star Brass Works Wheels, Wrought Steel Carnegie Steel Co. Illinois Steel Co. Ludlum Steel Co. Whistles, Air General Electric Co. Ohio Brass Co. Westinghouse E. & M. Co. Westinghouse Traction Brake Co.	Window Sash, Locks and Racks Morton Mfg. Co. Wire Rope American Steel & Wire Co. Roebling's Sons Co., J. A. Wires and Cables Acme Wire Co. American Brass Co. American Electrical Works American Steel & Wire Co. Anaconda Copper Min. Co. General Electric Co. Graybar Electric Co. Okonite Co. Okonite-Callender Cable Co., Inc. Roebling's Sons Co., J. A. Westinghouse E. & M. Co.
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Our advertisement in the issue of July 3 showed how
HASKELITE and PLYMETL
will lighten the weight of light-weight cars. Another advertisement
will appear in the issue of July 17.

HASKELITE MANUFACTURING CORPORATION
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N-L Ventilators
for Cars and Buses



The Nichols-Lintern Co.
Cleveland, Ohio



A Profitable Investment—New Cars

Outstanding results demonstrate that the introduction of new and modern type cars affords appreciable saving in operating and maintenance expenses.

About one year ago the Interstate Street Railway, Attleboro, Mass., replaced its obsolete 45,000 lb. equipment with five 31,000 lb. double-truck and three 16,000 lb. single-truck one-man cars, all modernly equipped to meet present-day requirements.

In this particular installation economies were effected in power and the cost of conducting transportation, in addition to maintenance. These were such that the

total expense per car mile was reduced from 37.59c. to 25.9c., which when figured on an annual basis is equivalent to a 65 per cent return on the capital invested.

With such results obtainable and the purchase of new cars made easy through a liberal financial plan, it is not only desirable but possible for every electric railway to stimulate its enterprise by the introduction of new cars of the modern type.

 **THE J. G. BRILL COMPANY** 
PHILADELPHIA, PA.

AMERICAN CAR CO. —
ST. LOUIS, MO.

G. C. KUHLMAN CAR CO. —
CLEVELAND, OHIO.

WASON MAN'G CO.
SPRINGFIELD, MASS.

Albany
says:

"The Gas Electric Bus
has passed beyond
the experimental
stage with our Com-
pany"

Part of statement by H. B. Weatherwax,
vice president United Traction Company,
Albany, N. Y. A subsidiary company,
The Capitol District Transportation
Company operates gas-electric buses.

Enthusiasm grows for the Gas-Electric Bus

Mr. Weatherwax went even further and stated that the gas-electric bus tested out in this company's service "thoroughly proved its superiority over other types for the work."

Then eighteen more were ordered, all of which have been in service several months.

These buses regularly negotiate the long Capitol Hill, on State Street, with a grade varying from $7\frac{1}{2}\%$ to 9% , and Arbor Hill which has even a steeper grade. They

are making a schedule speed of 11.21 miles per hour exclusive of lay over. These average schedules are 20% faster than with other types of buses previously operated.

The electric brake is used on every trip descending these grades and has been found a very important asset.

No wonder that Albany officials are enthusiastic about electric drive and that more Gas-Electrics have been ordered for other parts of the system.



First in the field with a commercially practical electric drive for buses, General Electric has since acquired experience that is invaluable. G-E equipment, in operation today on buses from coast to coast, is the recognized standard

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK
SALES OFFICES IN ALL PRINCIPAL CITIES
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ELECTRIC RAILWAY JOURNAL

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HOUSTON, TEXAS.

PRINCIPAL CITIES OF THE UNITED STATES

Numerically Arranged with 1920 Census Population

CITY	POPULATION	CITY	POPULATION
✓ New York, N. Y.....	5,620,048	✓ Minneapolis, Minn.....	380,582
✓ Chicago, Ill.....	2,701,705	✓ Kansas City, Mo.....	324,410
✓ Philadelphia, Pa.....	1,823,779	Seattle, Wash.....	315,652
✓ Detroit, Mich.....	993,739	Indianapolis, Ind.....	314,194
✓ Cleveland, Ohio.....	796,836	Jersey City, N. J.....	298,079
✓ St. Louis, Mo.....	772,897	Rochester, N. Y.....	295,750
✓ Boston, Mass.....	748,060	✓ Portland, Ore.....	258,288
✓ Baltimore, Md.....	733,826	✓ Denver, Colo.....	256,491
✓ Pittsburgh, Pa.....	588,193	✓ Toledo, Ohio.....	243,164
Los Angeles, Calif.....	576,673	✓ Providence, R. I.....	237,595
Buffalo, N. Y.....	506,775	Columbus, Ohio.....	237,031
San Francisco, Calif.....	506,676	✓ Louisville, Ky.....	234,891
✓ Milwaukee, Wis.....	457,147	St. Paul, Minn.....	234,680
✓ Washington, D. C.....	437,571	Oakland, Calif.....	216,261
✓ Newark, N. J.....	414,216	✓ Akron, Ohio.....	208,435
✓ Cincinnati, Ohio.....	401,247	Atlanta, Ga.....	200,616
✓ New Orleans, La.....	387,408		

The Principal Tie in the Principal Cities

60%
have
Twin Tie Installations

In the first 33 cities of the United States (those over 200,000 in the 1920 census), 20 of them have Steel Twin Tie installations, or plan to install Twin Ties in the present Season.

30%
are making
Twin Tie Installations
this season

Of the first 33 cities in the United States 10 are now installing Twin Ties or have scheduled installations for the Season.

15%
have standardized on
Twin Tie Track
for all work

5 have standardized on Steel Twin Tie Construction for all work.

The International Steel Tie Company
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track . . Permanent Foundation

Burned Fingers Can be Prevented

NO more burned controller fingers! The Westinghouse TA handle in conjunction with a line switch will prevent all drum arcing in backing off. It is quick, positive and safe in action, and can be quickly applied to K type controllers.

The TA Handle Switch

offers these important advantages:

1. The line switch opens **BEFORE** the drum begins to move.
2. Applied without change to the controller except to drill and tap the top plate for mounting.
3. Standard handles can be used.
4. All working parts of the handle switch are accessible by removing the cover plate.

The Westinghouse office nearest you will gladly supply full information, or write to

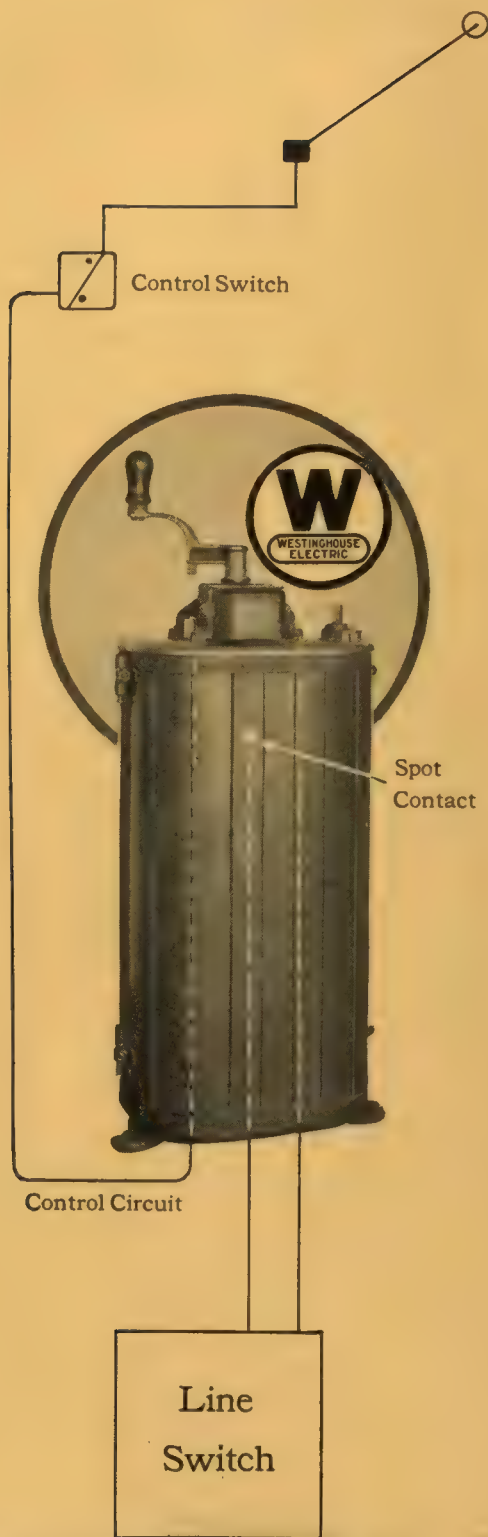
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**Renewal Parts Reduce
Maintenance Cost**



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Safety Device

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No. 3

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It Lives to Serve

FROM numerous sources have come words of commendation for the survey of car and bus purchases which was made by the JOURNAL in the issue for July 3. The comprehensive nature of the survey, the unequivocal statement of the pernicious condition existing within the industry in the matter of indifference to the needs for modern cars—these factors rendered it valuable to operating companies and car builders alike.

Undertakings such as this are among the varied services constantly being rendered to the industry by the staff of ELECTRIC RAILWAY JOURNAL. In order to arrive at the facts embodied on the latest survey, all of the car builders in the United States were called on for information concerning car orders received during the first six months of the year; the files of the JOURNAL for this period were thoroughly searched for all material which had been published on this subject, and confidential information was obtained by telegraph on proposed expenditures by railways for car and bus equipment during the balance of the year.

In spite of the critical situation existing this year in the matter of diminished car purchases, the survey was published to give the industry an opportunity to take stock of itself and to set about the correcting of its unsound condition.

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 SAVING THE RAIL SAVES THE RAILWAY

Are you a good merchant?

Clean cars, smooth track and uninterrupted service are equivalent to an attractive store, reliable delivery and worthy merchandise. Good merchants know their value.

Your cars may be modern and clean, your schedules may be ideal—yet your sales will fall off if your track does not provide safe, smooth, silent and satisfactory rides. It's up to your track maintenance.

Grind out all corrugations, weld and grind cupped joints and battered special work. It's good business, it's an economy—and it's easily done with the modern equipment we offer.

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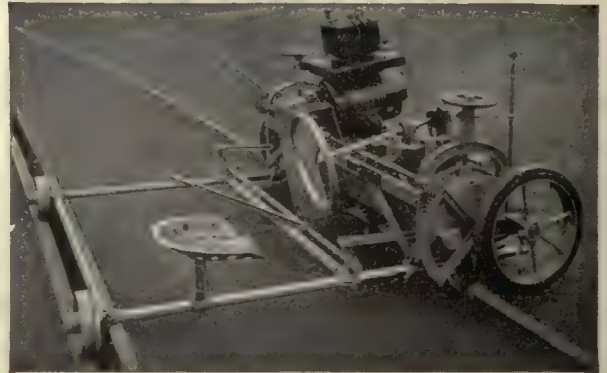
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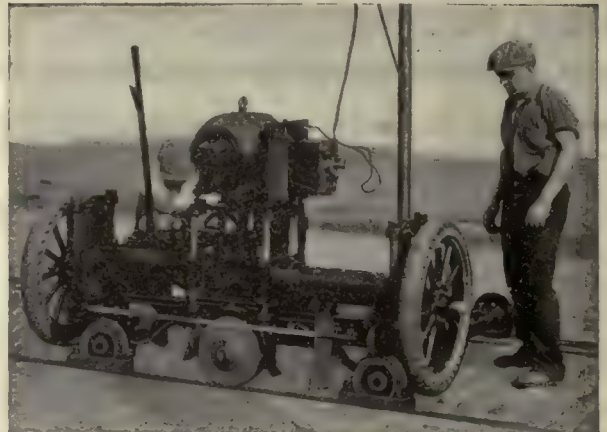
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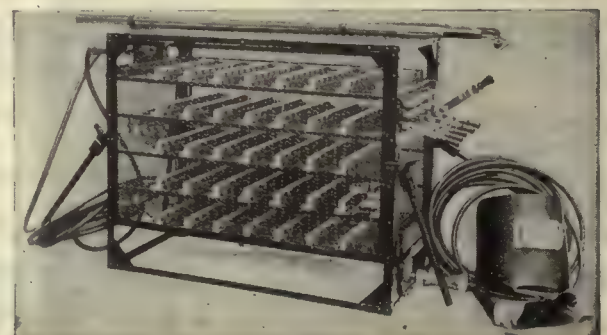
"Improved Atlas" Rail Grinder



"Imperial" Track Grinder

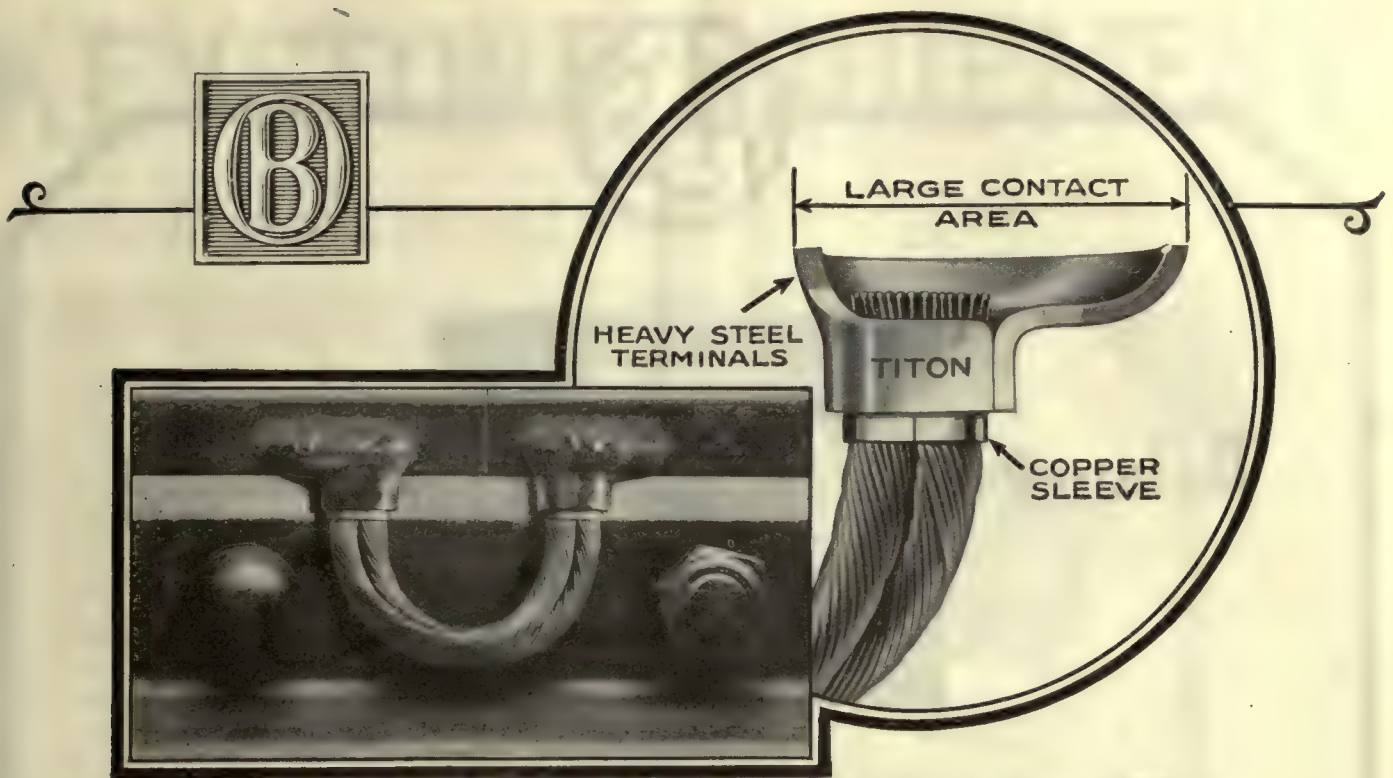


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 SAVING THE RAIL SAVES THE RAILWAY



Checkmate Bonding Problems With the New O-B Titon Bond

HOLD a Titon Bond in your hand—examine it critically in every detail of its clean cut design and long life construction. Watch your welders put one on the rail head, and put it on to stay, in about a minute and a half. Then test it thoroughly for electrical and mechanical efficiency.

That is all you need do to assure yourself, as others have done, that the O-B Titon Copper Arc Weld Bond is the one you will want to use for *all* your ball-of-rail bonding.

Large, heavy steel, offset terminals make it easy to secure a good, strong weld—to apply the bond properly so it has a permanently low electrical resistance. The terminals support the molten metal as deposited, provide a mechanical protection for the finished weld, and help insure a thorough union of the copper cable to the rail head through the medium of the deposited metal.

Another feature, the interior copper sleeve between terminals and cable strands, cushions and damps vibrations. It materially increases the life of the bond in service.

To make it convenient for you to send for a sample Titon Bond—to submit it to your welders for test and approval—a coupon is printed below.

Ohio Brass Company,
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197B

Gentlemen: Without cost or obligation please send me a sample of the new O-B Titon Bond. Also complete information about its application by the copper arc weld process.

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The "SIMPLEX AND AMERICAN MULTIPLE UNIT" clasp brakes with two brake shoes per wheel instead of one, doubles the braking area and accomplishes these results.

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American Multiple Unit Clasp Brake



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On the Illinois Central R.R. Electrification

Here is one of the outstanding electric railway equipment jobs of the year 1926—a heavy electrification project which has been under construction for several years. The first of the 215 new cars are just being delivered—and electric operation will soon be commenced.

Among the many distinguishing features of these fine new cars, not the least noteworthy are the applications of Keystone Car Equipment as indicated herewith.



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Type RA-128, a special design for heavy electric railway multiple unit trains, shaped to conform to the curve of the car roof. But the familiar standard Golden Glow glass reflector is there—to provide a powerful penetrating beam of non-dazzling light along the right-of-way.

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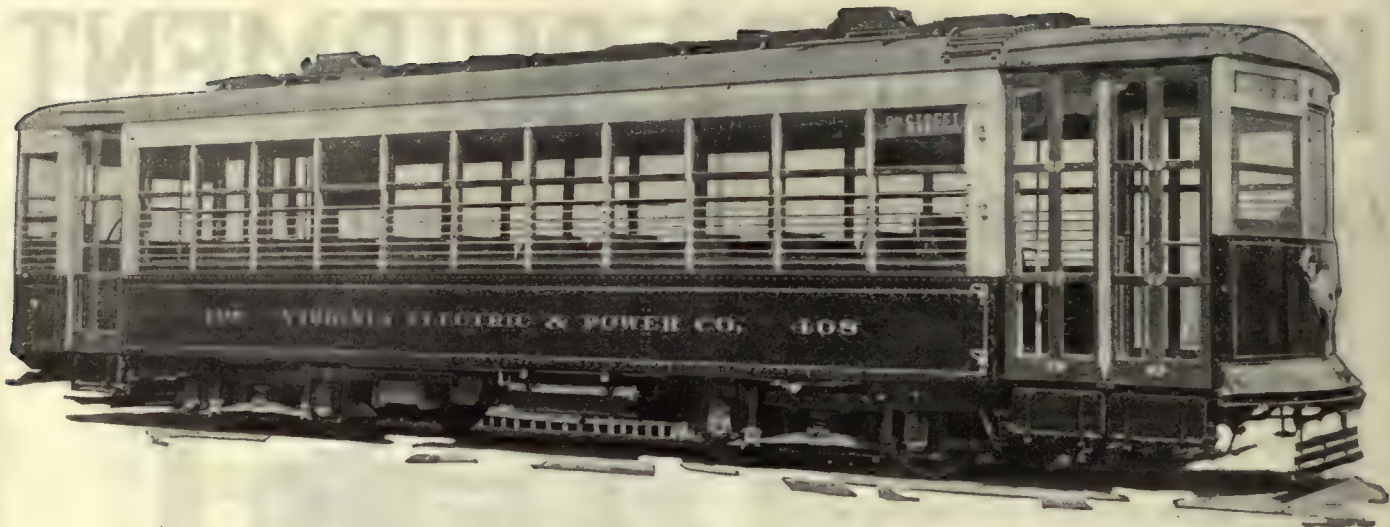
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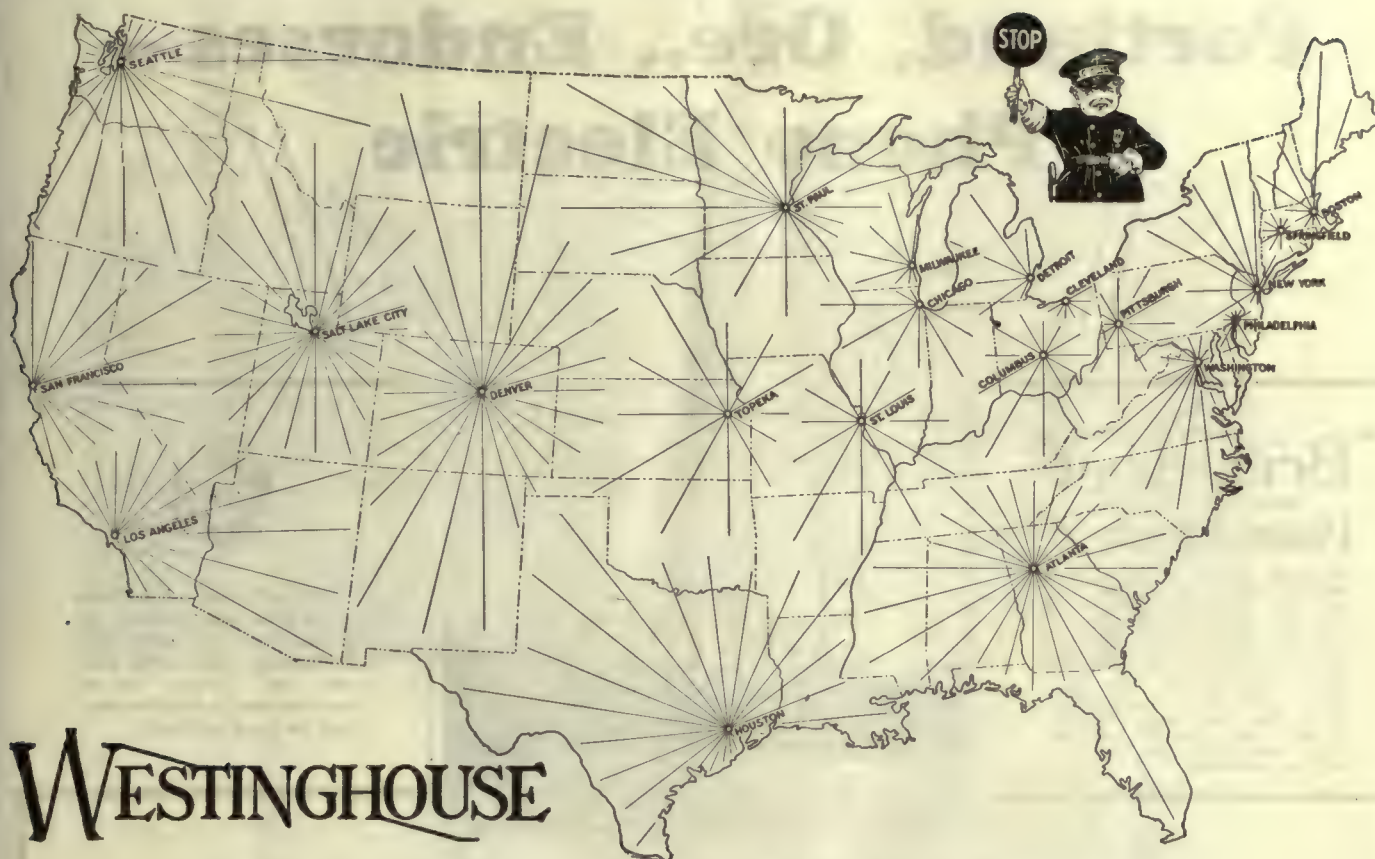


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Automotive Air Brake Service Covers the Map

Branch offices of the Westinghouse Air Brake Company—located in the principal cities of the United States—are “service stations” for Westinghouse Automotive Air Brakes.

Here are men especially trained in this branch of our business; men able to demonstrate the advantages of Westinghouse Air Brakes for modern automotive vehicles; men skilled in the application and maintenance of Westinghouse Air Brakes; men available for consultation and assistance to users of Westinghouse Air Brakes.

These men are at your service.

Westinghouse Air Brakes

- develop a retarding force sufficiently powerful for stopping even the heaviest car quickly, to increase safety and permit faster schedules.
- to provide automatic equalization, to minimize skidding and lengthen life of brake linings.
- relieve the driver of braking fatigue, to increase safety and utility.
- and permit the use of metal brake linings, to provide still greater safety and economy.

WESTINGHOUSE AIR BRAKE CO.
Automotive Division, Wilmerding, Pa.



Portland, Ore., Endorses— Phono Electric

"Bridgeport"
TRADE MARK
Phono-Electric

We made a point of asking the Portland Electric Power Company for their opinion on the question of conductivity. They stated that feeders, on which there is no wear, offset the slightly lower conductivity on their lines. This is the usual condition. But where conductivity is of vital importance, PHONO HI-CON now can be supplied with conductivity of 60% or 80% as specified.



This photograph shows part of the Phono-Electric installation on the Portland Electric Power Company's Council Crest line. Phono's exceptional wear resistance and high tensile strength make it especially valuable on sharp curves such as this.



An interesting booklet of Phono facts is now being mailed. It deals with the subjects of tensile strength, conductivity, wire wear, and "fatigue" in an interesting and exhaustive way. Have we your address?

Bridgeport
Brass Company
BRIDGEPORT - CONNECTICUT

Thirteen years does not seem like much in cold figures, but the World has been made over in that time, and the original Phono-Electric Trolley Wire installation in Portland, Oregon, has chalked up a total of more than 1,284,000 car passes. This on curves and main traveled arteries.

Much of it is still in place,—still giving good service, and a standing tribute to Phono as a solution to problems of wire-wear and overhead cost.

Such a record, backed as it is by authentic data proving similar and even greater records of service under widely varying conditions, furnishes one sound reason why leading roads in all parts of the country are using more and more Phono-Electric Trolley Wire.

We would particularly call your attention to the booklet mentioned above; and also to the detail of Portland's experience in relation to conductivity.

Phono-Electric



Carrying crowds
to the beaches



They



fight to get on



Asbury Park, Ocean Grove, Bradley Beach, Belmar and Long Branch, New Jersey—names which mean pleasure to thousands during the vacation season and which mean revenue to the Coast Cities Railway, operators of Yellow Coaches.

Along the North Jersey coast Yellow Coaches are furnishing coordinated service with the high peak spread over three months and complete coach equipment thrown in during this period.

Feeder bus lines, centering in Asbury Park, serve sections beyond the trolley zone and sightseeing lines operate along the famous Ocean Boulevard.

During the summer season the entire fleet of Yellow Coaches is kept running: 12 single decks and 13 double deckers—*Yellow Coaches exclusively*. And they fight to get on! Three hundred people milling around at the loading point. Even on a 10-minute headway of double deckers they can't carry them away. It's all they can do to keep the crowd in line.

During 1925 the fleet of Yellow Coaches piled up 564,574 miles at a total cost of .2325 cents per mile for operation and maintenance. This in the face of the fact that the coaches stop nearly every block during

the peak season. And from January 1 to October 31, 1925, Yellow Coaches carried 1,572,000 passengers.

A recent cost analysis of this operation disclosed the following figures:

	Single Deck Cents per Bus-Mile	Double Deck Cents per Bus-Mile
Maintenance of plant and equipment.....	0.006	0.011
Maintenance of buses and cars.....	1.804	1.413
Maintenance of carhouses and garage.....	0.017	.....
Power.....	2.931	3.178
Lubricants for buses.....	0.623	0.443
Tires and tubes.....	1.599	1.633
Carhouse and garage expenses.....	1.456	1.139
Bus and car operators.....	5.834	12.001
Other transportation expense.....	0.119	0.048
Rent of equipment.....	0.464	1.409
Superintendence.....	1.614	2.432
General office supplies and expenses.....	0.291	0.345
Advertising.....	0.103	0.404
Legal expenses.....	0.169	0.049
Stationery and printing.....	0.140	0.023
Injuries and damages.....	0.025	.....
Insurance.....	1.492	0.909
Licenses and taxes.....	0.312	4.195
Miscellaneous expenses.....	0.202	0.181
Total expenses per mile before depreciation	19.201	29.813
Depreciation.....	3.000	3.000
Total expenses per mile including depreciation	22.201	32.813

It will be noticed that in these figures are included some overlapping car expenses, but even with these added the total costs for operating Yellow Coaches tell their own story.

This is the third season down there for Yellow Coaches and again the fleet will write its record of successful and economical performance. Mechanically the coaches are free from trouble and keep moving in a type of service that taxes equipment to the limit.

The peculiarities of *your service* will yield to a Yellow Coach survey, whether seasonable or year-round.



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SUBSIDIARY GENERAL MOTORS CORPORATION

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“YOU PUSH THE BUTTON—”

PHYSICAL labor has no place in modern operation. In cars equipped with National Pneumatic Door and Step Controlling Mechanisms, the car man does not have to reach for or to struggle with door handles and door operating levers. He simply pushes a button and the National Pneumatic Engine does the rest.

NATIONAL PNEUMATIC COMPANY

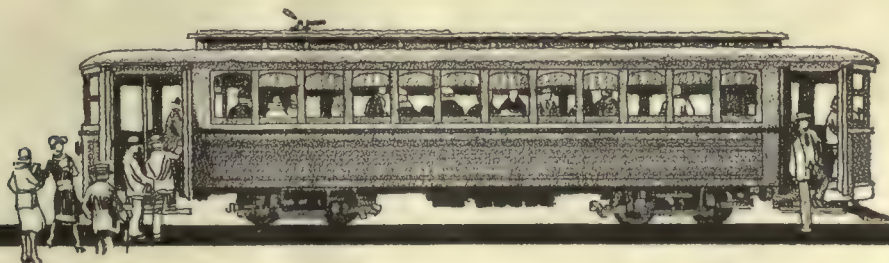
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General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

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 Chicago, West Towns & Northern R.R., Chicago, Ill.
 Lehigh Traction Co., Hazleton, Pa.
 United Electric Railway Co., Providence, R. I.
 Columbus Ry., Power & Lt. Co., Columbus, Ga.
 Boston Elevated Ry., Boston, Mass.
 Waterloo, Cedar Falls & North. R. R., Waterloo, Iowa
 Illinois Power Co., Springfield, Ill.
 Boston & Worcester St. Ry. Co., Framingham, Mass.
 Mississippi Valley Electric Co., Iowa City, Iowa
 New Orleans Public Service Co., New Orleans, La.
 Tampa Electric Co., Tampa, Fla.
 Chicago, South Bend & Northern Ry., Chicago, Ill.
 Chicago & Joliet Electric Ry. Co., Chicago
 Key West Electric Co., Key West, Fla.
 Oklahoma Union Ry. Co., Tulsa, Okla.
 Municipal Tramways Trust, Adelaide, S. Australia
 Iowa Southern Utilities Co., Inc., Des Moines, Iowa
 Holyoke Street Ry. Co., Holyoke, Mass.
 Durham Public Service Co., Durham, N. C.
 Coast Counties Gas & Elect. Co., San Francisco, Cal.
 Hartford & Springfield St. Ry., Co. Hartford, Conn.
 Worcester Consol. Street Ry., Worcester, Mass.
 Binghamton Ry. Co., Binghamton, N. Y.
 Wisconsin Power & Light Co., Madison, Wis.
 Kansas City Rys., Kansas City, Mo.
 Iowa Railway & Light Co., Des Moines, Iowa
 Omaha & Lincoln Ry. & Lt. Co., Omaha, Neb.
 Arkansas Central Power Co., Little Rock, Ark.
 Twin City Rapid Transit Co., St. Paul, Minn.
 Wilkes-Barre Ry. Co., Wilkes-Barre, Pa.
 Phillipsburg Traction Co., Phillipsburg, N. J.
 Wilmington & Philadelphia Traction Co.
 Nashua Street Ry. Co., Nashua, N. H.
 Union Street Ry. Co., New Bedford, Mass.
 Baton Rouge Electric Co., Baton Rouge, La.
 Municipal Ry., Eureka, Cal.
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 Topeka Railway Co., Topeka, Kans.
 Duluth Street Ry. Co., Duluth, Minn.
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 Kan. City, Leavenworth & West. Ry., Kan. City, Mo.
 Virginia Ry. & Power Co., Norfolk, Va.
 New York State Railways
 Third Ave. Ry., New York City
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 Dubuque Electric Co., Dubuque, Ia.
 East St. Louis Ry. Co., East St. Louis, Ill.
 Los Angeles Ry., Los Angeles, Cal.
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 Newburgh Public Service Corp., Newburgh, N. Y.
 Pittsburgh Ry. Co., Pittsburgh, Pa.
 Savannah Electric & Power Co., Savannah, Ga.
 Tacoma Ry. & Power Co., Tacoma, Wash.
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 Lehigh Valley Transit Co., Allentown, Pa.
 Wellington City Council, Wellington, N. Z.
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 Detroit United Ry., Detroit, Mich.
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 Maumee Valley Trans. Co., Perrysburg, O.
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Mack-Made Buses

25-Passenger City Type

29-Passenger City Type

25-Passenger Parlor Car

25-Passenger Suburban Type

29-Passenger Suburban Type

25-Passenger Gas-Electric

29-Passenger Gas-Electric

Five 74 Mile round trips a day— and never missed a run for the Des Moines & Central Iowa Motor Transportation Company

That's the performance of three Mack parlor car buses, operating since last September on this company's Des Moines—Newton inter-urban line.

The schedule calls for five round trips a day, and *the buses haven't missed a trip* since the line was inaugurated. Only four times have they been late in leaving the terminals, and then only a few minutes.

Mack performance wins again.

The distance from Des Moines to Newton is 37 miles, about half of which is pavement. The balance of the highway is in poor condition—dirt and gravel surfacing. There are several bad grades which test the power of the Mack-built engine. Each bus averages seven stops a

trip and running time one way is one hour and a half. Each bus has covered to date better than 40,000 miles while repairs have consisted only of minor adjustments.

Tires, due to correct distribution of weight and perfect alignment, are averaging between 20,000 and 23,000 miles, fuel consumption is slightly better than seven miles to a gallon while a gallon of lubricating oil is sufficient for 400 miles. Complete operating costs, including depreciation, is normal; that is, equal to the original estimate. Mack performance, shown in marked economy of operation and maintenance, is producing constantly growing revenue, "with which we are distinctly pleased."

The nearest Mack factory branch is ready to indicate tangible and profitable operation for you.



MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
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The World's largest steam



PRINCIPAL PRODUCTS

Mercury-Arc Power Rectifiers (steel enclosed)

Electric Locomotives—for any system of current, high or low tensions

Complete equipment for railway electrification

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Ships

Diesel Driven

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Structural Steel Fabrication

THE largest unit yet constructed for the generation of electric power was recently ordered for the Hell Gate Station of the New York Edison-United Company System. This turbo-generator will be built by the American Brown Boveri Electric Corporation at its main plant in Camden, New Jersey.

The size and character of this unit presents for the consideration of American Utilities engineers an entirely new ratio between equipment costs and land and building costs, in the Kw. price of generating stations.

The New York Edison-United Company System has always been recognized to be among the most progressive of America's electrical companies. Its management has faced and met electrical problems created through the growth of New York City, by the use of engineering talent of resource and vision.

AMERICAN

announces —

turbo-generator unit

Electrical and Mechanical Characteristics

Power output — 251,000 hp. at unity power factor,
188,250 kva., or 160,000 kw. at 85 per cent
power factor.

Direct-connected exciters.

Compound unit—reaction type throughout.

Throttle pressure—265 lb. per sq. inch.

Superheat—200 deg. (present conditions at Hell
Gate Station).

Maximum steam temperature—750 deg. F.

Single-flow, high-pressure element operates at
1,800 r.p.m.

Double-flow, low-pressure element, operates at
1,200 r.p.m.

Total weight—2,810,000 lb.

American Brown Boveri Electric Corporation

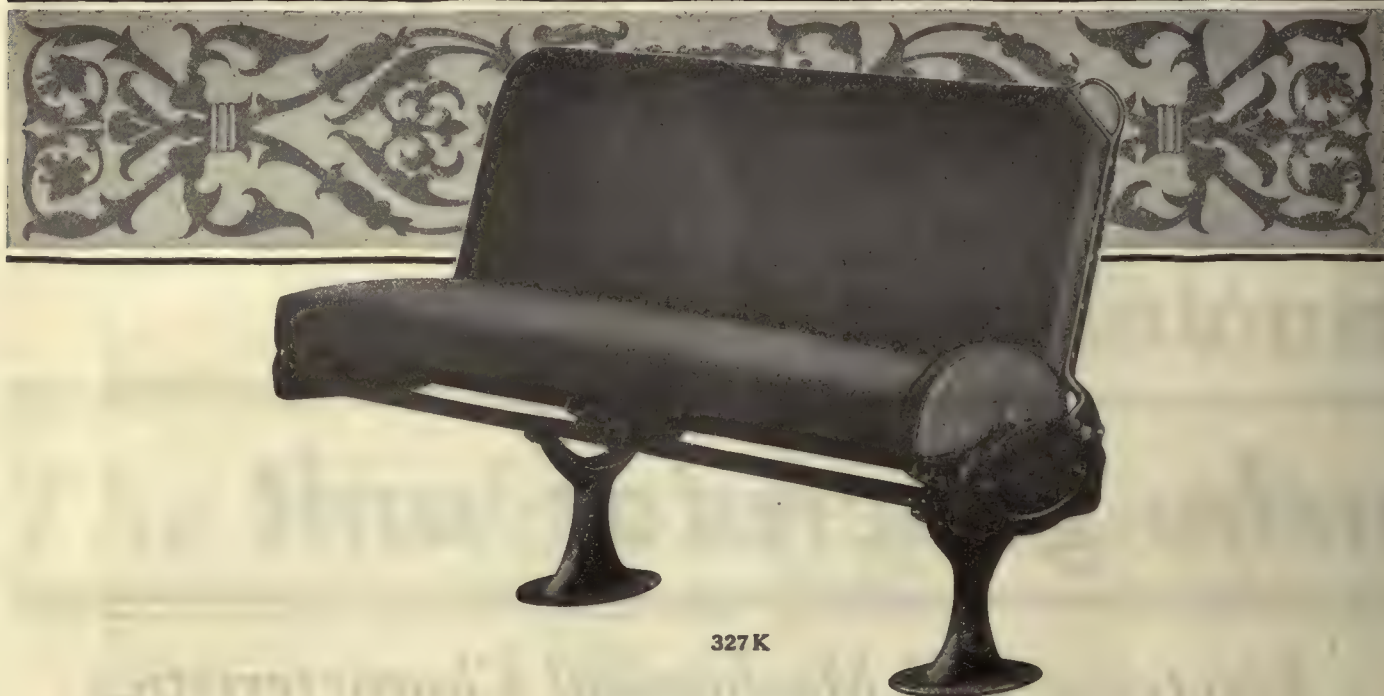
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Camden, New Jersey

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100 · YEARS · OF · MANUFACTURING · EXPERIENCE ·



327K

A New H-W Seat for Gas-Electric Cars

That Heywood-Wakefield seating engineers keep step with every new demand in passenger transportation is evidenced by this new Gas-electric car seat.

This model of reversible seat may be had for two or three passengers, with or without arm rests and upholstered to suit service conditions. No. 327K has been adopted by some of the large eastern roads and is certain to prove a popular item of the complete H-W passenger-seating line.

Why not consult with H-W experts on your present seating problems? Consultation costs you nothing.



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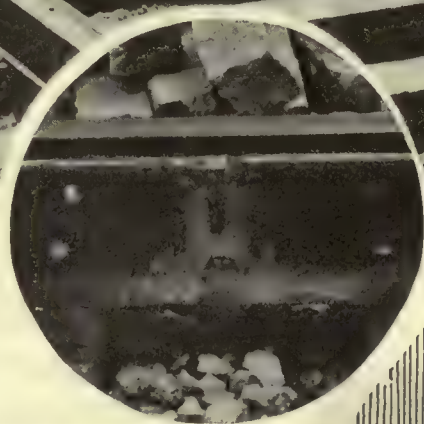
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68-70 St. Antoine St., Montreal;
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Making Trouble-Free Track for Philadelphia's Sesqui-Centennial Traffic

The Philadelphia Rapid Transit Company, planning to carry 100,000 people an hour at the peak of the Sesqui-Centennial traffic, is building permanent track. This track is being built not only for this immediate traffic necessity, but for years of future service in a newly developing section of the city.



THERMIT WELDS *will do it*

By joining rails instead of jointing them, Thermit welds eliminate the joints entirely, forming one continuous unbroken piece of track, which rides as smoothly and wears as evenly, as the balance of the rail-head itself. Thermit-welding is now the accepted method in modern track construction.



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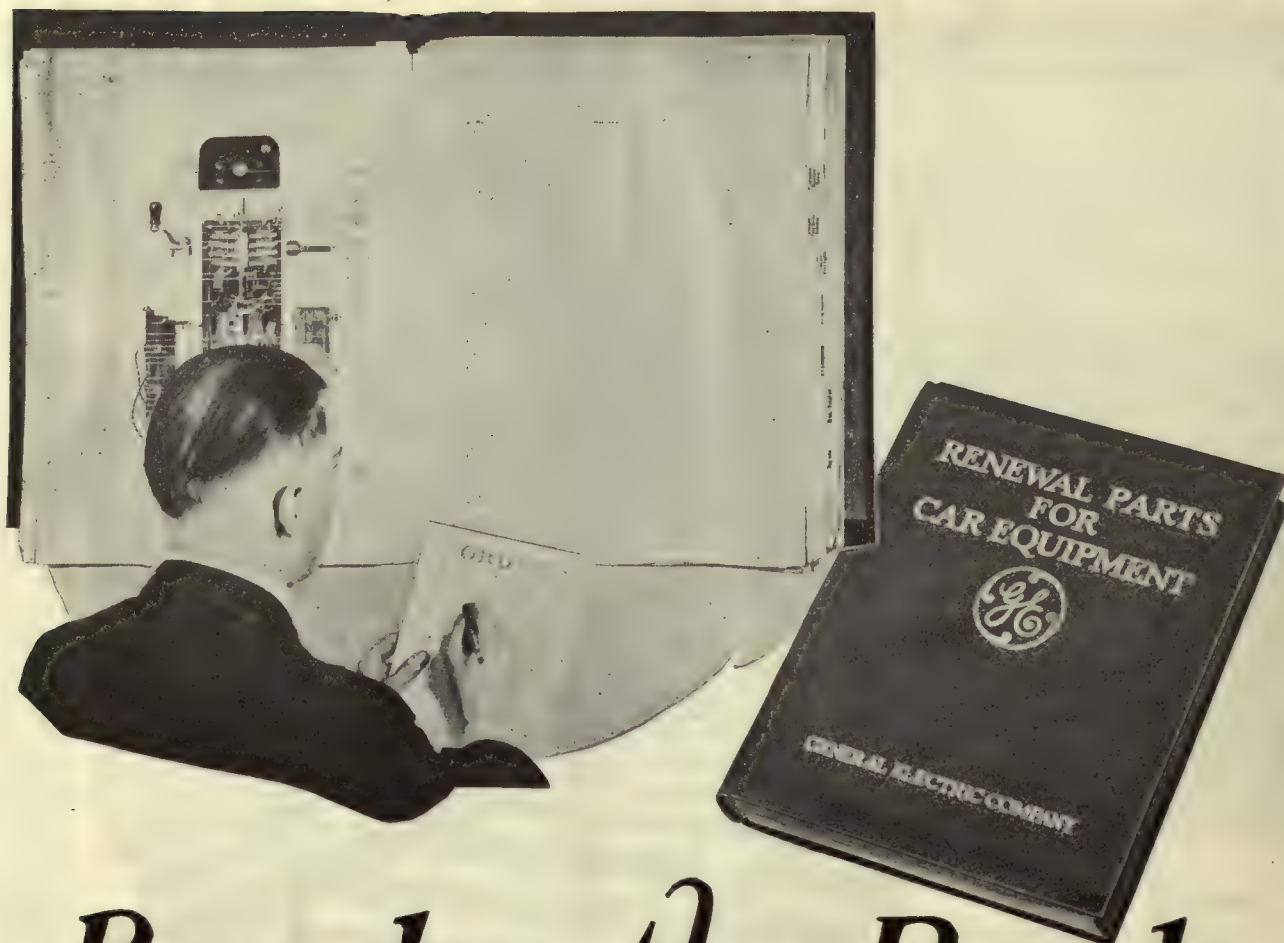
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GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 68

New York, Saturday, July 17, 1926

Number 3

Magnetic Brakes Together with Air Give Short, Positive Stop

HIGH schedule speeds are essential if electric railways are to attract the additional riders to which electric cars are entitled. Along with high speed goes the necessity for the most effective braking equipment possible. The International Utilities Corporation, which owns and operates the Buffalo & Erie Railway and the Kentucky Traction & Terminal Company, has developed a form of magnetic track brake for use in addition to the air brakes already on the cars. The installation of these brakes is nearly completed on all cars operated by these two properties. Details of the equipment together with some test results are given in this issue of the JOURNAL.

This form of magnetic track brake was developed primarily to meet emergency conditions that arise continually on any rail system and which require cars to be stopped in the shortest distance possible regardless of rail conditions. Therefore the magnetic brake equipment is hooked up so as to function automatically whenever the air brake handle is thrown to the emergency position. The retarding force developed by the magnetic track brakes is thus added directly to the maximum that can be obtained by the air brakes. Observations on the Buffalo & Erie Railway show that from ten to twelve emergency stops are made daily. Several very bad accidents have already been avoided by cars equipped with the new features.

Results of tests given in the article show that a reduction of the distance required to bring a car to a stop of from 30 to 35 per cent can reasonably be expected. The reduction in time to make stops is sometimes also of vital importance. One case occurred where an automobile came out of a blind driveway and crossed directly in front of an approaching car. The distance was so short that even with the additional braking force of the magnetic brakes the car could not be stopped before reaching the crossing. The increased time element, however, enabled the automobile to get across, so that a collision was avoided.

An interesting feature of the magnetic equipment is the use of air pressure to force the magnetic shoes down in contact with the rail. This provision enables the magnetic shoes to be carried at a distance of $2\frac{1}{2}$ in. above the running rail. The necessity for a small air gap is thus done away with and there is no need for particular attention to the maintenance of tracks and adjustment of the shoes in order to get maximum braking results.

The framework which supports the magnetic shoes is spring hung, so that it is not a dead weight overhanging the truck structure. The attachment of the magnetic

shoes to the trucks of the double-truck cars is back of the trailing wheels and is of link form. The additional retarding force is thus a pull through these links. Results from the trial equipments, which have now been in service more than six months, show that the addition of the magnetic brakes has had no unfavorable results on the truck structure. The wearing parts of the magnetic shoes are replaceable and adjustments for wear can be made easily.

At this time, when electric railways are using all possible means to make cars safer and better and to provide more attractive service, this innovation in braking equipment is of particular value and results will be watched with interest.

Axle Bearings Should Receive More Careful Inspection

EXCESSIVELY worn axle bearings are causing much trouble in electric railway equipments. They are allowed to become loose and are not given the careful attention they demand. The minimum air gap between armature and pole faces determines when armature bearings must be renewed. If armature bearings are allowed to continue in service with the small air gap the inspector knows that the armature will soon rub the pole faces and probably be damaged beyond repair. He may lose his job as a result and so he will not take chances. The equipment inspector has no such definite gage for axle bearings and does not check them closely.

Axle bearings should be given the same careful attention as armature bearings. It is a mistake to assume that by keeping them in service longer reduced cost will result. The cost of maintaining axle bearings may be lower, but other maintenance costs will mount rapidly instead. Loose axle bearings are disastrous to gears and pinions. From one-half to two-thirds of the mileage that could be obtained with accurately meshed gearing is lost by axles and shafts being out of adjustment and by too great spread between centers.

Maintenance practices that have improved axle bearing conditions in Kansas City are described in the paper by R. W. Bailey presented at the Midwest Electric Railway Association, abstracted elsewhere in this issue. The Kansas City Railways uses die-cast axle bearings. The cost of these is but one-half that of bronze bearings, so they can be replaced at frequent intervals and close limits for bearing wear can be used. With a die-cast type of axle bearing old material can be melted and used for the new bearings, and as the bearings are cast with all windows, keyways, oil grooves, etc., no finishing or machining is necessary.

Particular care is also used in fitting each bearing to

This is the issue in July that is devoted essentially to maintenance subjects

the axle about which it is to operate. Whenever a pair of wheels is changed the axle bearings are returned to the shop and new ones are fitted.

Car trucks cause more rattling and disturbing noises than any other part of the equipment. The most important parts of the truck are the bearings. Axle bearings, particularly, should be given more careful inspection and should be renewed more frequently.

Why Do Operators Often Design and Build Their Own Cars?

NOT long ago a new face appeared in the executive office of a large railway property. It developed that this man was employed to design cars to be built either in outside establishments or in the well-equipped shops of the company. The same company is using many buses, it also uses substation equipment and many standard and sometimes easily constructed maintenance units.

Why the complex on cars? What was the psychology back of this desire to design only this one physical thing used in the conduct of the property? Does this company have a peculiar bias or perhaps a hobby on this particular part of its equipment, while taking a normal attitude toward other parts of its property? Or is this caused by lack of originality and initiative on the part of long-established car building companies, resulting in failure to anticipate the needs of this operator?

It is not alone this one incident that raises these questions, but that this tendency has appeared over and over again in many parts of the country. Many cases of car designing complexes on the part of operating companies could be cited. But it is unfortunate that such a condition continues in the face of the magnificent effort now being made to pull this essential industry out of the mire of despondency.

Just as one trained soldier is worth many untrained civilians when in battle, so should one corps of car designers with vision and experience, backed by a management with a desire to lead, be able to outdistance the entire operating group in the question of design. Certainly, since the operating companies have had the spirit to weather the distress and difficulty of recent years and still aspire to seek something better, the car building companies should be able and willing to assume the leadership in design and manufacture.

Wrong Impressions Are Worse than No Consciousness at All

THIS thought is suggested by a recent track-renewal job that was being done in conjunction with the widening and repaving of a business street in a city which is an important transportation center. The work was so extensive as to necessitate temporary suspension of the electric railway service on this street. In the early stages it looked as if the electric railway line was being abandoned. This was the impression gained even by some electric railway men who were passing through the city and were among the large numbers of out-of-town people to see the work in progress. Perhaps this conclusion was justified, as there was nothing to indicate otherwise, but it illustrates the great tendency of the public mind to believe that the electric railway has reached the peak of its usefulness.

The local business man who has his store remodeled seldom fails to make known, at least to the passers-by, that it is "being enlarged in order better to accommodate our growing patronage" or "still further to improve service to our customers." But the merchants of transportation have not learned equally well the value of pointing out to their patrons the better-service significance of new improvements and investments, although the improvements made by the electric railway, which is established to serve the whole community, are of much more general interest. True, it may not always be practicable to point out the better service represented in ordinary track reconstruction, yet posters telling, for instance, something of the cost per mile would add to the common knowledge and, in the case cited, could have prevented some misinformation of a kind which just now is altogether too plentiful.

People see the motor bus being introduced both as an addition and as an adjunct to their present transportation. Some have seen it replace as well as extend electric railway service. Not being in a position to know its limitations, many overestimate its possibilities and so expect less from the electric railway of the future. This is a state of mind which makes it essential, more than ever before, that the people, all potential railway customers, be correctly informed. It must be remembered that the average individual comprehends very little of the activities, the problems and the plans of his local electric railway. Strangely enough, even the indispensability of this public servant is not always obvious, much less appreciated. No panacea can be offered for this condition. Each company must be alert to take advantage of every opportunity to achieve and maintain in the public mind a proper conception of its purpose and its importance. A sympathetic public must have the facts.

Mr. Coffin's Life Story Is an Inspiration

FEW men have the ability and genius to organize and control capital and labor as did Charles A. Coffin, who passed away this week after a long and useful career. Without his courage, his vision and his perseverance the General Electric Company, which he founded, would probably never have developed into the world-wide organization it became under his direction.

His active connection with that company and its predecessors has covered the entire history of electrical development as it is known today. He was a successful business man in Lynn, Mass., during the early eighties when Elihu Thomson was a struggling inventor, trying to interest people in his newly developed arc light generator and lamp. Finally some of Mr. Thomson's friends appealed to Mr. Coffin to give them the benefit of his commercial experience in the manufacture and sale of this new machinery. For a number of years the company over whose affairs Mr. Coffin presided, the Thomson-Houston Electric Company, devoted itself primarily to Professor Thomson's series lighting system, while its principal competitor, the Edison Electric Manufacturing and associated companies, developed the low-voltage direct-current incandescent lighting system. When the two organizations were brought together the choice of the man to lead the destiny of the combined company fell on Mr. Coffin.

While not specially trained in science or electricity,

he was not slow to grasp the possibilities of the new power. Furthermore, he saw that much could be accomplished by investigation and research, not only toward improvement in methods but even more in looking far afield to find possible new applications of the mighty force. No one was more ready to expend large sums of money to encourage research in pure and applied science, even though its connection with the business might seem remote.

It was characteristic of Mr. Coffin that the men about him were far better known to the general public than he was himself. While he was most approachable and willing to talk about the industry, he was always ready to attribute to others credit for achievements for which all recognized he was largely responsible.

Conditions such as those that brought Mr. Coffin into the electrical industry in its early days will never be repeated. Nevertheless, there is even more opportunity for the young man in the business today, in no small part due to his work. The story of his life should be an inspiration to men in the field, just as are the awards given in his name an inspiration to better and yet better work by the companies.

Interborough Sues Strikers for Injury to Its Business

SUIT for \$239,000 damages has been brought by the Interborough Rapid Transit Company against 62 of its striking employees. It is based on a very fundamental principle of law. This is that if A and B have entered into a valid contract by which A employs B and C seeks maliciously to procure a breach of this contract, C can be enjoined and sued for damages. The word "maliciously" in this connection does not mean necessarily with malice or ill will, but with intention to interfere with the business of A.

This principle has been fully adjudicated by the United States Supreme Court, most notably perhaps in *Hitchman Coal & Coke Company vs. Mitchell et al.* (245 U. S., 229), where the defendants directly and through agents attempted to call out on strike the employees of a non-union coal mining company and thereby injuriously affected the company's business. In this opinion, which was delivered by Justice Pitney on Dec. 10, 1917, a number of very definite principles of law were laid down. One of these is that an employer is entirely free to make non-membership in a particular union a condition of employment. Another is that the right of men to strike did not give the defendants in the case the right to instigate a strike. In other words, the purpose entertained by the defendants to bring about a strike in the mine so as to compel the owner to consent to the unionization of the mine was an unlawful purpose. Hence the court approved the grant of an injunction against the defendants to prevent them from interfering or attempting to interfere with the employees of the mine for the purpose of unionizing it, of wilfully trying to induce them to break their contracts of service or leave their service without their employer's consent, or intimidating them.

The New York courts are also very clear on this subject, notably in *Calvin A. Lamb vs. S. Cheney & Son* (227 New York, 418), where the court said:

Where a man employs a laborer, and another man, knowing of such contract of employment, entices, hires or persuades the laborer to leave the service of the first employer during the time for which he was so employed, the law

gives the party injured a right of action to recover damages.

While the Interborough is asking for injunction and damages, it has not applied for a temporary injunction to prevent its striking employees from committing unlawful acts, such as endeavoring to persuade present employees to abandon their duties. Should this temporary injunction be requested, precedents in the New York courts indicate that it would be granted. Thus it is only seven years ago that the New York Supreme Court granted such an injunction in the case of *Third Avenue Railway vs. Patrick J. Shea, Amalgamated Association of Street & Electric Railway Employees, W. D. Mahon, et al.* This injunction required the defendants to refrain from interfering with the performance of the contract of employment between the railway company and its employees, from approaching or conferring with said employees as a part of any attempt to induce them to break their contracts with the railway company, from enrolling or attempting to enroll said employees in said Amalgamated Association without the consent of their employer, from enticing said employees, present and future, under like contract, to leave the service of their employer, etc. The New York courts have also shown themselves ready to act under the Penal Code in case of unlawful acts by strikers, as shown in the case of the 1916 Interborough strike, where some 720 strikers received sentences, some for imprisonment and others for fines.

In other words the courts, both federal and state, at least so far as New York State is concerned, have very definitely declared they will penalize all persons who do not mind their own business but unlawfully interfere with the business of others. Labor organizations should realize this fact. Individual strikers should also understand the peril which they run in trying unlawfully to injure the business of a former employer. It was for this very offense that less than ten years ago, in the *Danbury Hatters' case*, a judgment was obtained against some 186 former employees for about \$80,000, for injuring the business of D. C. Lowe & Company, hat makers. Under the Sherman anti-trust law this amount was tripled, making it about \$240,000, and interest brought it up to about \$300,000. Writs of attachment were levied on the bank accounts and homes of the defendants, who finally raised about \$80,000. The efforts of labor organizations to raise the rest of the money are well known, and \$150,000 was secured through voluntary contributions, making a total of about \$230,000, which was finally accepted in settlement by the plaintiffs.

In brief, the law says that a man is free to leave work which is unsatisfactory at the end of his term of contract, just as the employer is free to discharge him at such time, but he is not free to incite others to break their contracts with his former employer or otherwise injure his business unlawfully.

It would be especially desirable if this principle should be realized and enforced in public utility cases. In them the public has a vital interest. Discontinuance of the manufacture of hats by a single maker for a longer or shorter period does not seriously affect the people at large. They can buy their hats from another maker. But with the public utility the situation is different. It is to be hoped that the legal principles on which the Interborough suit is based will be again laid down by the courts. It will be a good thing for all concerned.



Car on Buffalo & Erie
Railway Equipped with
Magnetic Track Brakes

Emergency Stopping Distance Decreased 22.5 to 46 per Cent

By Using Magnetic Track Brakes to Supplement Air Brakes on Its Interurban Cars the Buffalo & Erie Railway Increases Retardation Materially—Makes Brake Effective Regardless of Rail Conditions—Permits Higher Maximum Speed and Reduces Front-End Accidents

FOLLOWING careful tests with magnetic track brakes to supplement the air brakes, the Buffalo & Erie Railway, Fredonia, N. Y., and the Kentucky Traction & Terminal Company, Lexington, Ky., are proceeding to equip all of their cars with the equipment developed. Tests on two sample equipments were made on the Buffalo & Erie line late last year and further developments and improvements were made this year while the two cars were continued in regular service. Officers of the International Utilities Corporation, which owns the two railway properties, feel that this development is of tremendous value. The tests conducted have shown that regardless of rail conditions the supplementary magnetic brake equipment gives a positive form of braking; that the braking distance is decreased from 22.5 per cent to 46 per cent over what would be obtained with air brakes alone, and that a further decrease can be made to any reasonable amount desired. With the installation of this type of supplementary braking schedule speed can be improved. Careful checking of results obtained has led the management to believe that a very large proportion of front-end accidents can be eliminated with the additional braking equipment and catastrophe hazards, such as runaways,

car collisions and inability of motormen to control cars, are prevented. Checks on the number of emergency stops show that there are from ten to twelve daily.

As an example of the prevention of accidents with this improved braking equipment, one case occurred where an automobile came from behind a truck and stalled on the railway track. The motorman barely had time to apply the brakes. Thanks to the high rate of retardation obtained through the addition of the magnetic brakes the car stopped within 2 ft. of the automobile. Without this high rate of retardation a very bad accident would have resulted.

NEW TYPE OF BRAKE DEVELOPED

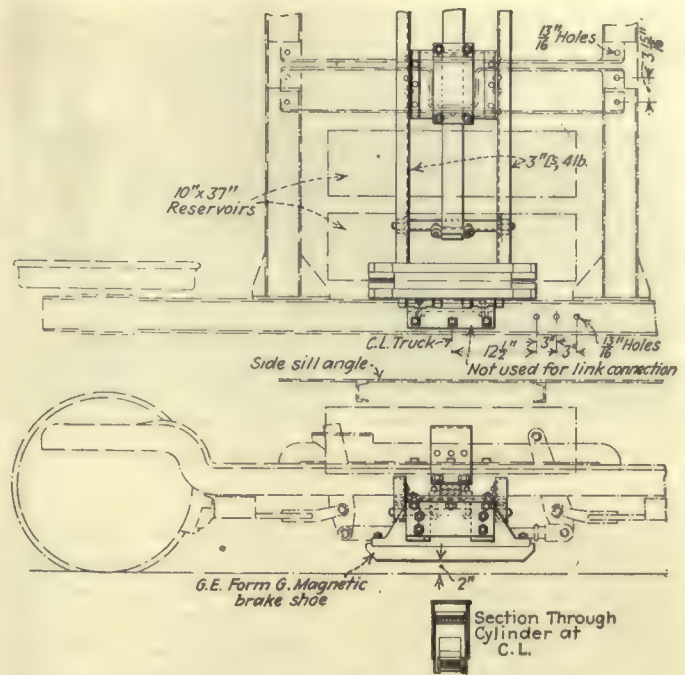
The type of magnetic brakes used is quite different from the usual forms such as have been used in this country, as on cars of the West Penn Railway and very extensively abroad, particularly in England. In its regular running position the bottom of the magnetic shoe is maintained 2 in. above the top of the running rail. When the brakes are applied air pressure first brings the magnet shoes into contact with the running rail and then through the energizing of the electromagnets magnetic braking results. By this means the

very small air gap required with other forms of magnetic track brake is not used. In England the magnetic brake shoes are maintained from $\frac{1}{8}$ to $\frac{1}{4}$ in. above the surface of the rail. It will be appreciated by electric railway operators that such a small clearance must require close attention to the maintenance of tracks as well as to the braking equipment itself.

The additional electrical equipment used in this installation on the lines of the Buffalo & Erie Railway and the Kentucky Traction & Terminal Company's cars is being furnished by the General Electric Company. The mechanical parts and suspensions are furnished by the Cincinnati Car Company. On double-truck cars four magnetic shoes are used and on single-truck cars but two shoes. Accompanying line drawings show the method of supporting the equipment on the two types of trucks. On single-truck cars the magnetic brake shoes are attached to the trucks so that the shoes come in contact with the rail midway between the two wheels on each side. On cars which use the Cincinnati Car Company's RS-60-D double trucks a pair of brake shoes is attached to the outside framing of each truck.

A rigid supporting framework of two 3-in. x 2-in. x $\frac{3}{8}$ -in angles is carried across the end of the truck. These are anchored at each end to bars 4 in. x 1 in., which extend back to the truck-pedestal castings. There are also additional supporting bars to the upper part of the truck framework at each end. The two angles are connected at the center by a plate which serves as the saddle for a semi-elliptic spring. The air cylinder for pushing the shoes down in contact with the rail also forms a part of this center saddle. The cylinder is 5 in. in diameter and 8 in. long. The piston of the air cylinder is attached to a similar circular section, which fits closely inside the air cylinder and extends down to the movable support for the magnetic shoes.

The movable framework which supports the shoes consists of two 3-in., 4-lb. channels, which extend across the ends of the truck. The magnetic shoes are mounted at the ends of these. These channels are connected together at the center by a built-up structure of angles and plates. The movable part of the air cylinder is attached to this. At the ends of the movable framework two adjustable screws form the connection to saddles which hook into the ends of the semi-elliptic spring. The shoes are guided by the permanent structure extending down outside of the shoes so as to prevent excessive sidewise motion. They are also held



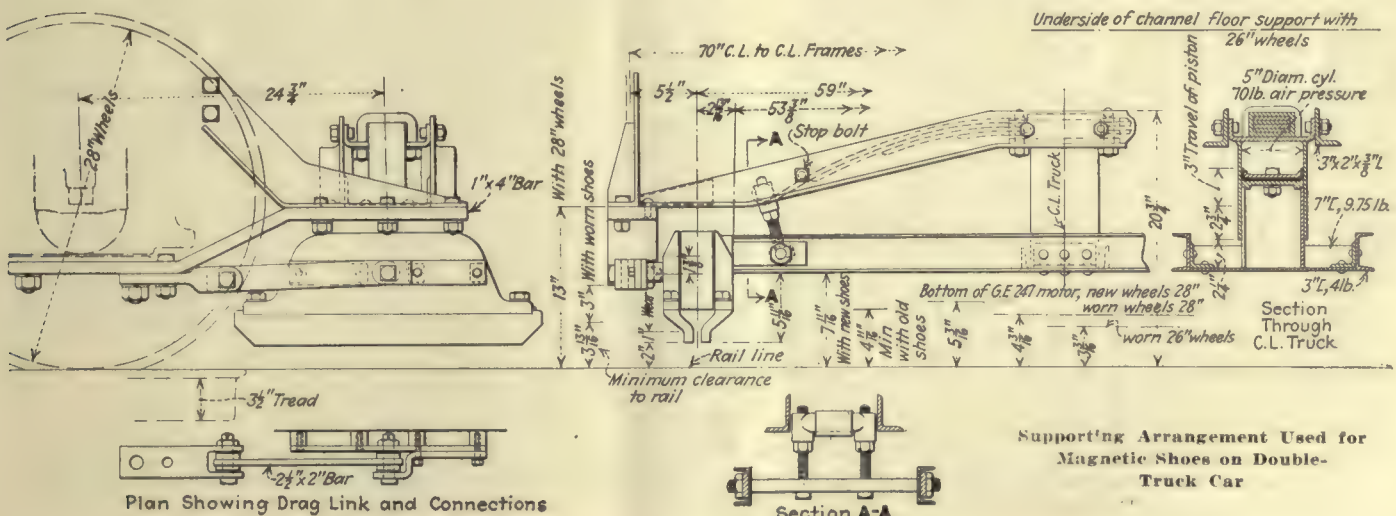
Method of Supporting Magnetic Brake Shoes on Single-Truck Car

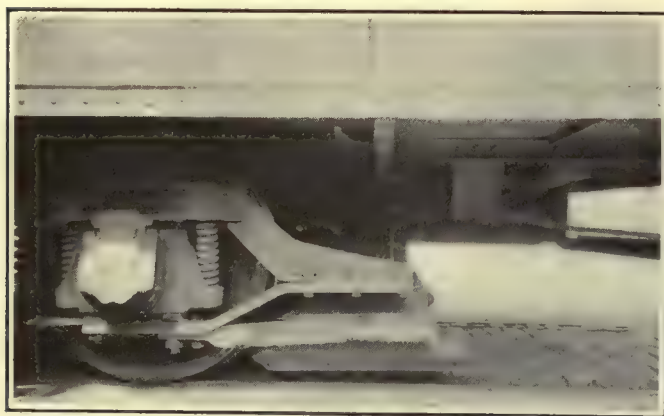
longitudinally by links which connect to a clevis attached to the lower part of the pedestal casting. The two stationary angles which extend across the end of the truck also serve as guides for the saddles which are attached to the ends of the springs. When the shoes are down the retarding force is transmitted through the link connection.

The bottom of the stationary framework immediately above the shoes is 13 in. above the rail line with new 28-in. diameter wheels, and the outside construction which serves as a guide for the shoes extends down to within $6\frac{1}{8}$ in. of the rail line. The adjustable screws which form the connection from the ends of the spring to the movable beam provide an adjustment of the magnetic shoes for wheel wear, so that uniform height of the shoes above the rail line can be maintained up to the scrapping diameter of the wheels.

STANDARD METHOD OF BRAKE OPERATION USED

For operating the brakes a standard M-28 brake valve is used without change. The sander connection is used to supply air for operating an electro-magnetic switch.



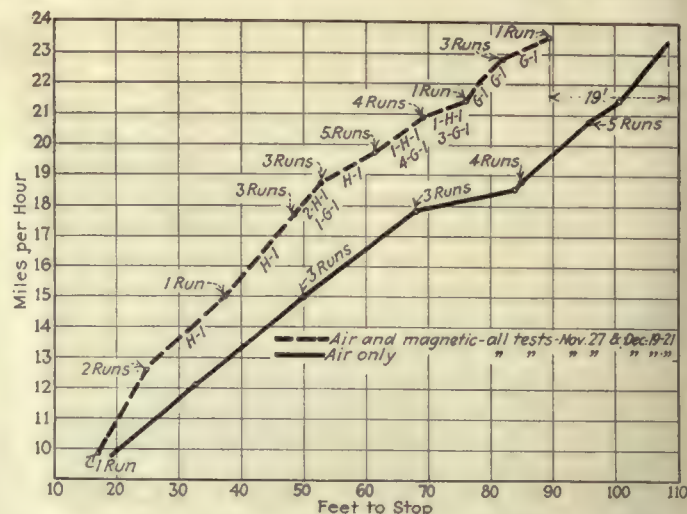


Magnetic Track Brake Shoes at Trailing End of Front Truck on Double-Track Car

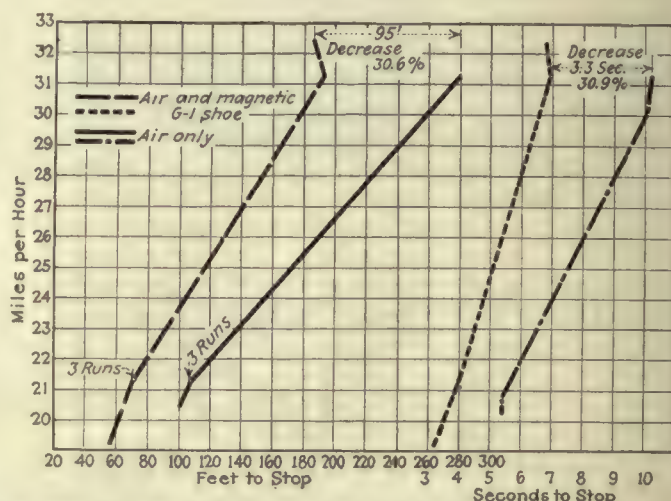
This closes the electric circuit to operate a contactor, which in turn energizes the coils of the magnetic brake shoes. Two shoe coils are connected in series with a resistor and trolley voltage is used. With this arrangement the magnetic brakes must be used every time the brake valve is thrown to the emergency position, and they can be operated independently if desired. In addition to this equipment, a relay valve is used to control the time that the magnetic coils are energized. In the service operated by the test equipment this was arranged to keep the coils energized for 24 seconds. Two fuses mounted in an MA-13 fuse box serve to protect the line breaker and the auxiliary operating circuits. Air connections to the magnetic brake operating cylinder are made through two $\frac{3}{4}$ -in. hose. A union with a choke is used to govern the leakage of air for cutting out the contactor.

DECREASED TIME AND DISTANCE

The accompanying graphs show average results of a number of tests made to determine the decreased time and distance that would result by the use of the magnetic brakes, together with the air brakes as compared



Decreased Distance to Stop at Various Speeds When Using Air and Magnetic Brakes as Compared with Air Alone. Two Types of Magnetic Brake Shoes Were Used During the Test Made on a Single-Track Car

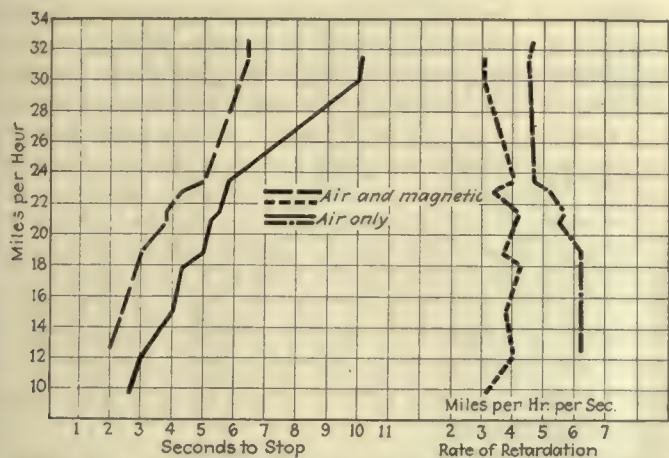


Comparison of Stopping Distances and Stopping Time Using the Type of Magnetic Shoes Finally Adopted as Compared with Air Alone on Single-Track Car

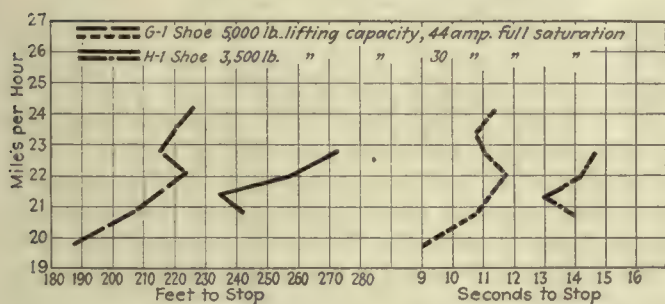
Table I—Braking Tests on Single-Track Car Weighing 17,000 Lb. Light

Kind of Stop	Air Pressure, Lb.	Braking Current, Amp.	Speed When Brakes Were Applied, M.P.H.	Time to Stop, Sec.	Distance to Stop, Ft.	—Decrease of Air-Magnetic Over Air Alone—				Rate of Retardation, Average	Increased Rate of Retardation, With Air-Magnetic	Per Cent Increase in Rate of Retardation
						In Stopping Distance, Ft.	In Stopping Distance, Per Cent	In Time to Stop, Sec.	In Stopping Time, Per Cent			
Air.....	70		21.4	5.1	95.05					4.22		
Air-Magnetic.....	70	43.3	21.4	3.8	73.17	21.88	23.0	1.27	25.0	5.63	1.41	33.4
Air.....	70		21.4	5.2	114.83					4.11		
Air-Magnetic.....	70	43.0	21.4	4.0	81.17	23.66	22.5	1.20	23.0	5.35	1.24	30.1
Air.....	65		21.4	6.0	110.25					3.56		
Air-Magnetic.....	60	40.0	21.4	4.2	77.00	33.25	30.1	1.80	30.0	5.09	1.53	43.0
Air.....	60		21.4	6.8	128.00					3.14		
Air-Magnetic.....	70		20.8	5.3	97.27					3.95		
Air.....	70	42.7	20.8	3.8	69.14	28.13	28.9	1.46	27.7	5.47	1.52	38.4
Air-Magnetic.....	70		18.8	5.0	85.33					3.76		
Air.....	70	43.0	18.8	3.0	57.66	27.67	32.4	2.00	40.0	6.26	2.50	66.5
Air-Magnetic.....	70		12.1	3.0	32.50					4.03		
Air.....	70	43.0	12.5	2.0	29.50	8.00	24.6	1.00	33.3	6.25	2.22	55.0
Air-Magnetic.....	70		22.8	6.8	132.17					3.35		
Air.....	60	43.0	22.8	5.0	90.75	41.42	31.3	1.80	26.4	4.56	1.21	36.0
Air-Magnetic.....	70		22.8	4.4	82.00					5.18		
Air.....	70	57.0	22.0	4.2	78.00					5.24		
Air-Magnetic.....	70	57.0	20.3	4.4	66.17					4.51		
Air.....	65	42.0	19.3	3.8	74.00					5.08		
Air-Magnetic.....	70	41.0	20.8	5.4	104.3					3.85		
Air.....	70	47	21.4	4.0	76.3	28.0	26.8	1.4	26.0	5.35	1.50	39.0
Air-Magnetic.....	70		20.3	5.4	101.25					3.76		
Air.....	70	47	21.4	4.0	68.75	32.5	32.1	1.4	26.0	5.35	1.59	42.2
Air-Magnetic.....	70	48	19.25	3.2	56.5					6.01		
Air.....	70	47	11.5	2.2	22.3					5.23		
Air-Magnetic.....	70	48	32.5*		200.0							
Air.....	70	49	31.3*	6.8	187.0	94.25	33.5	3.4	33.3			
Air-Magnetic.....	70	48	31.3*	7.0	193.3	87.95	31.3	3.2	31.3			
Air.....	70		31.3*	10.2	281.25							
Air-Magnetic.....	70		30.0*	10.0	259.25							
Air.....	70		32.5*	6.8	186.8							

* The last six tests were made by running down $\frac{1}{4}$ per cent grade and applying brakes when level track was reached. The speed given is the average for 220 ft preceding point of brake application and is not the speed when brakes were applied.

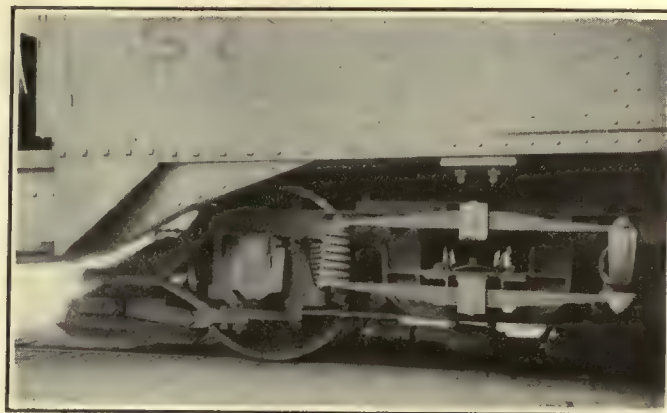


Decreased Time to Stop and Comparison of Rates of Retardation When Using Air and Magnetic Brakes as Compared with Air Alone. Same Series of Tests as Given at Top of Page 98



Comparison of Stopping Distances and Time of Stopping for Two Types of Shoes on Single-Truck Car

with air brakes alone. Tests were also conducted with two different types of shoes called H-1 and G-1. The G-1 shoe had a longer contact surface and gave the better results. It was 21½ in. long and is made in two parts. Each half has a contact area of 16.31 sq.in., or 32.62 sq.in. total, as compared with a length of 15½ in. and a total contact area of 22.88 sq.in. for the H-1 shoe. Both types have renewable portions ¾ in. thick, which should have an average life of about nine months. The new equipments are being furnished



Magnetic Track Brakes at Trailing End of Rear Truck

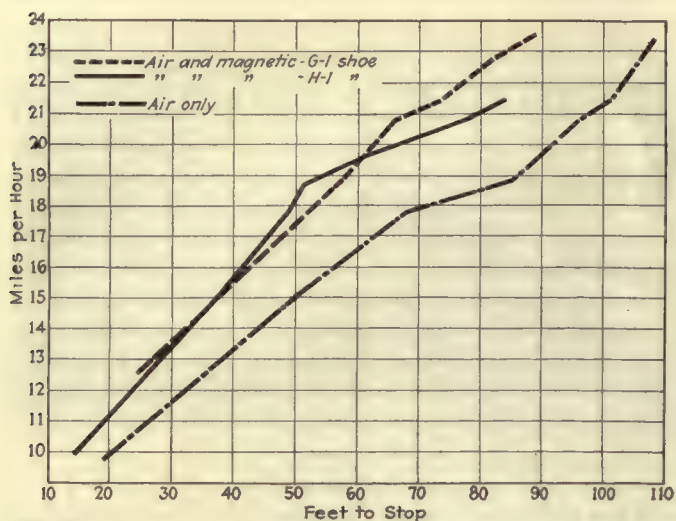
with the G-1 type of shoe. In general, rates of retardation when using both air and the magnetic track brakes were obtained up to 6.2 m.p.h. per second. Averages over a large number of tests showed that the time to stop from a speed of about 22 m.p.h. could be reduced approximately 26 per cent by the use of the magnetic brakes in addition to air. A corresponding decrease in the distance required to stop of 23 per cent was obtained and the rate of retardation was increased nearly 44 per cent. Tests were made on two types of cars. One was a single-truck car weighing 17,000 lb. without passenger load. During the test an average load of fourteen passengers was carried in the car. The braking ratio was 104 per cent and the air pressure used was 70 lb. The double-truck car used in the tests weighed 38,000 lb. without passenger load. An average of eight passengers was carried in the car during the test and the braking ratio was about 100 per cent. The average current taken by the magnetic shoe was 48 amp.

METHOD USED IN TESTS

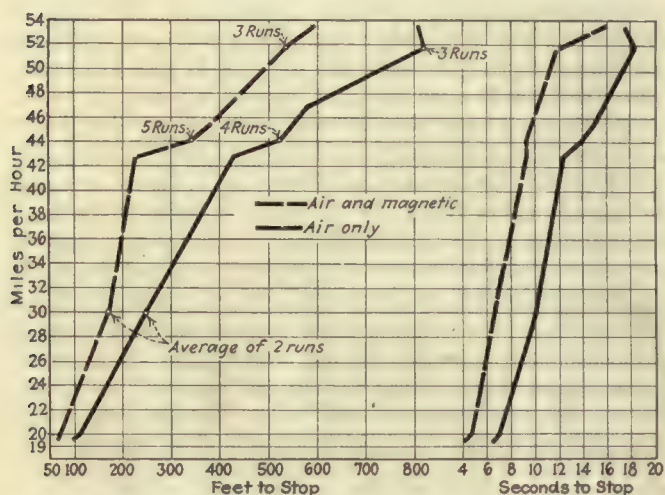
The method followed in making the tests was to place two red flags on a level stretch of tangent track spaced 220 ft. apart. The time to run over this distance was taken by two stop watches, while the speed was maintained as nearly uniform as possible. From this, the

Table II—Braking Tests on Double-Truck Car Weighing 38,000 Lb. Light

Kind of Stop	Air Pressure, Lb.	Line Volts	Current Taken by Each Magnet, Amp.	Speed When Brakes Were Applied, M.P.H.	Time to Stop, Sec.	—Decrease of Air-Magnetic Over Air Alone—				Rate of Retardation, Average	Increased Rate of Retardation With Air-Magnetic	Per Cent Increase in Rate of Retardation
						In Stopping Distance, Ft.	In Stopping Distance, Per Cent	In Time to Stop, Sec.	In Stopping Time, Per Cent			
Air.....	70	640		19.5	6.6	97.33				3.0		
Air-Magnetic....	70	640	45.0	19.5	4.2	66.50	30.83	2.4	36.3	4.6	1.6	53.3
Air.....	70	640		20.0	7.0	112.80				2.8		
Air-Magnetic....	70	645	45.0	20.0	4.8	71.25	41.55	2.2	30.0	4.1	1.3	46.4
Air.....	70	625		30.0	10.0	245.33				3.0		
Air-Magnetic....	70	640	47.5	30.0	6.4	170.66	74.67	3.6	36.0	4.7	1.7	56.7
Air.....	70	640		30.0	10.4	256.00				2.9		
Air-Magnetic....	70	635	47.5	30.0	7.0	174.00	82.00	3.4	32.0	4.3	1.4	48.2
Air.....	70	655		42.8	12.4	427.00				3.5		
Air-Magnetic....	70	645	47.5	42.8	9.4	230.25	196.75	3.0	24.0	4.5	1.0	28.5
Air.....	70	640		44.1	14.8	537.75				3.0		
Air.....	70	630		44.1	14.0	523.00				3.1		
Air.....	70	640		44.1	13.6	479.00				3.2		
Air-Magnetic....	70	640	47.5	44.1	9.4	342.50	137.50	4.2	30.9	4.7	1.5	46.9
Air.....	70	620		45.4	15.0	553.75				3.0		
Air-Magnetic....	70	640	45.0	45.4	10.8	402.00	151.75	4.2	28.0	4.3	1.3	43.3
Air-Magnetic....	70	645	47.5	45.4	10.2	378.50	175.25	4.8	32.0	4.4	1.4	46.7
Air-Magnetic....	70	645	47.5	45.4	9.0	351.00	202.75	6.0	40.0	5.0	2.0	66.7
Air.....	70	615		44.1	13.0	562.00				3.4		
Air-Magnetic....	70	615	45	45.4	9.8	397.00	165.00	3.2	24.6	4.6	1.2	35.3
Air-Magnetic....	70	615	45	45.4	9.4	382.00	180.00	3.6	27.7	4.8	1.4	41.2
Air.....	70	620		46.9	15.6	585.00				3.0		
Air.....	70	580		51.7	18.8	829.00				2.7		
Air.....	70	580		51.7	18.2	818.00				2.7		
Air.....	70	590		51.7	18.0	821.00				2.8		
Air-Magnetic....	70	590	45	51.7	11.8	537.00	284.00	6.2	34.4	4.4	1.6	57.1
Air.....	70	590		53.5	17.6	809.00				3.0		
Air-Magnetic....	70	590		53.5	13.0	617.00	192.00	4.6	26.0	4.1	1.1	36.7
Air-Magnetic....	70	590		53.5	12.6	603.00	206.00	5.0	28.4	4.2	1.2	40.0
Air-Magnetic....	70	590		53.5	12.0	579.00	230.00	5.6	31.8	4.4	1.4	46.7



Decreased Distances to Stop and Comparison of Results Obtained with G-1 and H-1 Magnetic Shoes on Single-Track Car



Comparison of Stopping Distances and Time to Stop of Air and Magnetic Brakes Compared with Air Alone on Double-Track Car

speed at the time the brakes were applied was computed and the distance was measured from the second red flag, at which the brakes were applied, to the stopping point.

This new development was undertaken by the management with the definite idea of finding some means by which the cars could be stopped quickly under abnormal

conditions of the rail. To determine what could be done under such conditions, a test was made with greased rails, both tracks being smudged with black car oil for a distance of about 65 ft. A number of stopping tests were made on Feb. 8 and 9, 1926. At this time it was snowing and the rail was very wet, in addition to being greased. Brakes were applied 20 ft. before the greased section was reached and all wheels were locked and slid the full length of the stop. Average stopping distances were from a speed of 40 m.p.h., 450 ft.; from 25 m.p.h., 300 ft., and from 15 m.p.h., 120 ft. Magnetic brakes were used in addition to the air. These stopping distances are nearly as good as those obtained with air brakes alone on a good rail, as can be seen by referring to results in Table II.

When cars are required to stop on signal from prospective passengers accuracy in stopping is of advantage. If a car runs by a passenger, the inconvenience may put him in a disagreeable frame of mind. Where the operator sees that his car will not stop at the point desired, the magnetic brakes can be brought into action by operating the air valve even though a service application of the air brakes has been made.

Some tests of stopping distances and times to stop were made, using a service application of the air brakes together with the magnetic brakes. An average of four tests made with air alone gave a stopping distance of 561 ft. from a speed of 32.6 m.p.h. The average time to stop was 22.35 seconds and the average rate of retardation was 1.83 m.p.h. per second.

An average of four similar stops made using both air and magnetic brakes from a speed of 31.9 m.p.h. gave an average stopping time of 15.05 seconds, an average stopping distance of 334 ft. and an average rate of retardation of 2.95 m.p.h. per second.

Honolulu Company Co-ordinates Its Transportation Service

SIX buses are now being operated by the Honolulu Rapid Transit Company. The bodies were designed and built in the company's shops. Seats are provided for 21 passengers. The chassis are Reo Model W. An attractive appearance is given to the outside of the bus by a liberal use of striping. Each vehicle has a name as well as a number, and a pictorial presentation of the name is made just above the lettering.



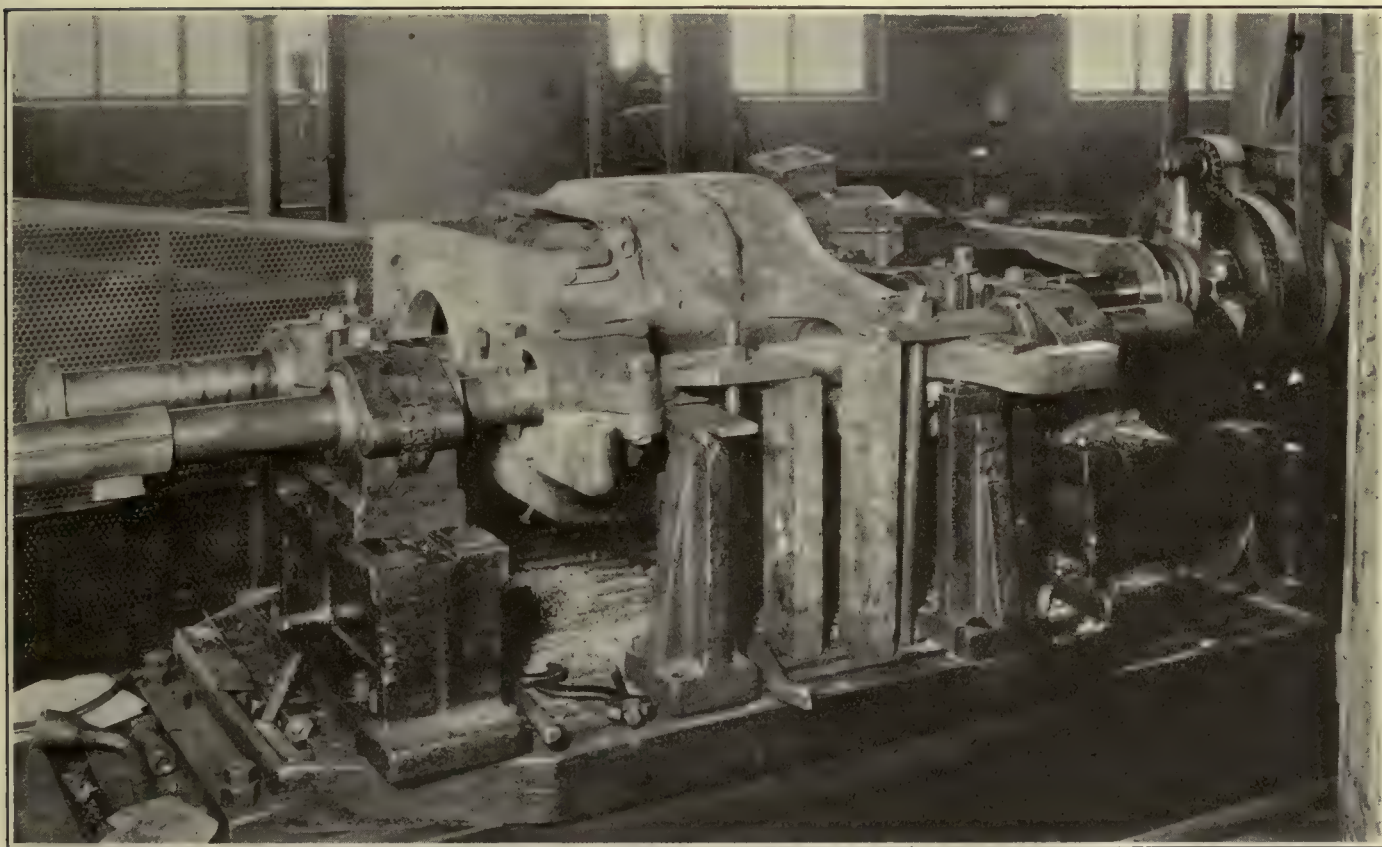
The "Red Dragon" of the Bus Fleet of the Honolulu Rapid Transit Company

Welding and Remachining Split Frame Motors

To Carry Out a Program for Welding, Building Up and Remachining Worn Motor Frame Fits Successfully Requires a Definite Plan for the Work—Such a Program Is Outlined Here

By J. M. Zimmerman

Renewal Parts Engineering, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.



A Westinghouse 101-B Split Frame Motor Mounted on the Boring Mill Table After the Cast-Iron Drum Has Been Located Properly in the Frame. The Split Must Be Above the Center Line of the Boring Bar

RAILWAY shopmen, when starting a program for arc welding and reboring motor frames, are often at a loss to know the proper method of welding, machining, how to measure the machined frame and within what limits certain dimensions must be kept. The following program was outlined for the Washington Railway & Electric Company at the beginning of its practice of welding and reboring split frame motors and has proved entirely satisfactory.

Welding in order to build up worn fits of the motor frame is a very important part in rehabilitating a railway motor. Improper welding is liable to warp the frame. If this happens, the upper and lower halves may not fit properly, so as to clamp the housings and axle bearing tightly. If the motor frame is well reinforced it may be possible to rebore for oversize housings and bearings without welding. It is cheaper to rebore the housing fit oversize and purchase oversize

housings than to weld the housing bore and remachine it to standard size; this will eliminate the cost of welding. However, the extra cost of welding the housing bore may be more than offset by the inconvenience of carrying more than one size of housing in stock.

WELDING THE HOUSING FIT

The inside housing fit on the motor frame may be worn from $\frac{1}{16}$ in. to $\frac{1}{8}$ in. Unless this face is built up by welding, the armature end play will be greater than that for which the motor was originally designed. Both the inside and outside housing fits should be welded so as to allow sufficient metal for finishing both sides. In welding this part of the frame the bead should be "put down" perpendicular to the circumference in the housing bore and not with the circumference. If it is "put down" the latter way, when the metal cools and shrinks it will set up strains which will

tend to warp the motor frame, because the length of the weld is longer and, due to the housing bore, the frame cannot resist the pulling action of the weld when it cools. On the other hand, the shrinkage of the short weld will be small as compared to a long weld. The accompanying illustration shows the procedure and the notes refer to the methods.

If the housing bore is to be welded, the beads should be "put down" parallel with the axis of the bore and not with the circumference of the bore. This again brings up the same possibility of warping the frame as explained in the preceding paragraph.

It is preferable not to weld the axle-bearing bore of the frame. All motor frames which have the gear case arm cast as part of the frame are not as well reinforced as other parts of the frame, so at this point

complete layer has been "put down" and the metal is cold it is well to hammer the entire surface of the weld either with an air or a riveting hammer. This will stretch the newly laid metal, thus relieving the shrinkage strains which are caused by the metal shrinking when it cools. This allows the motor frame to spring back to its original shape.

A low-carbon wire will give the best results. A high-carbon wire should not be used in welding the motor frame because the weld will be too hard to machine.

Good values of current to use for "putting down" the beads are 200 amp. with $\frac{3}{8}$ -in. rod and 160 amp. with $\frac{1}{2}$ -in. rod.

The reboring can be done on either a single or double-spindle horizontal boring mill. With the use of

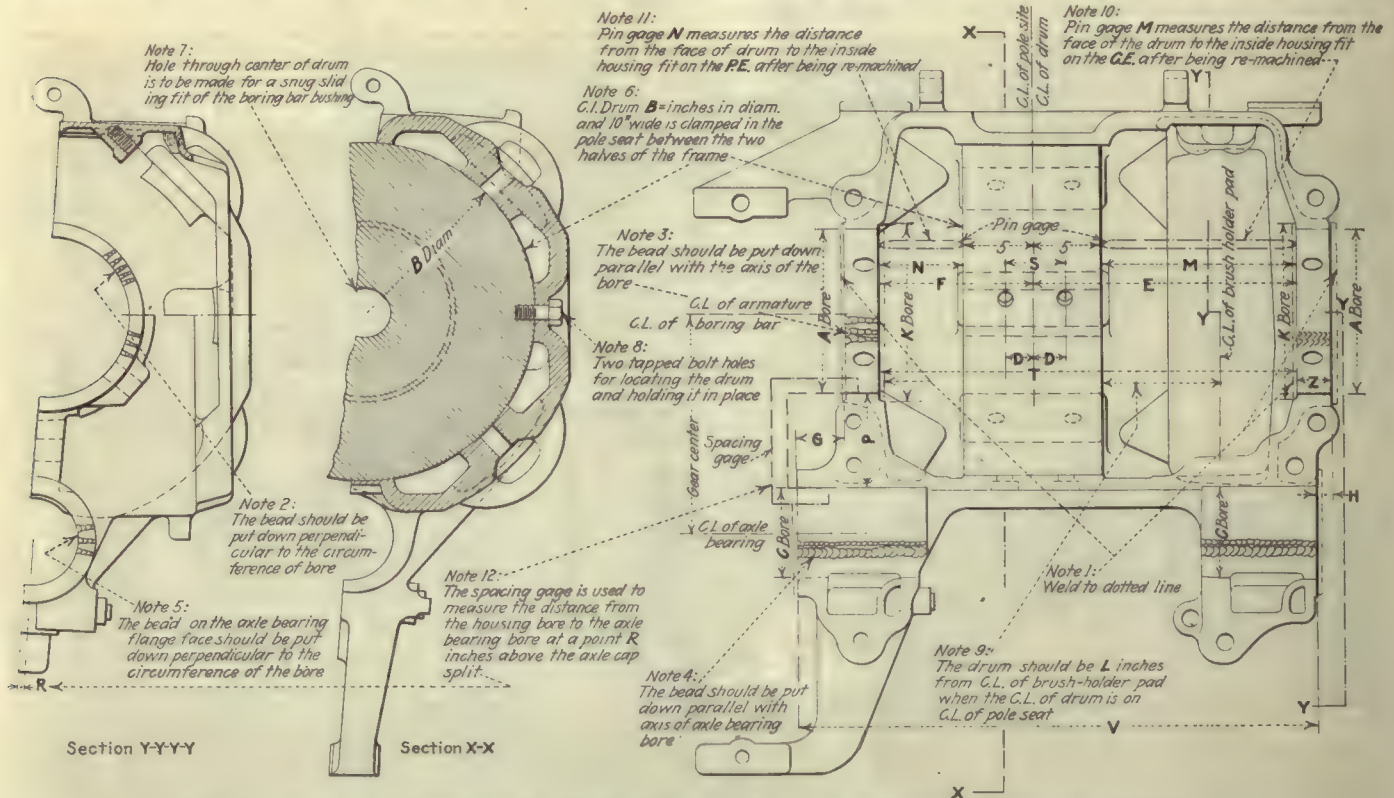


Diagram of Welding Operations and Machining Operations on Westinghouse Split Frame Motor

the warping will be more pronounced if the welding operation is not done with the most extreme care. If the axle cap warps during the welding operation the frame fit can be planed. However, the average railway shop is not equipped to plane the motor frame should the axle cap fit on the motor frame become warped. It is easier and cheaper to rebores the frame and axle cap $\frac{1}{8}$ in. oversize and purchase $\frac{1}{8}$ -in. oversize bearings. This eliminates welding costs. If the welding operation is to be done, the beads should be "put down" parallel with the axis of the axle bearing bore and not with the circumference of the bore. If they are "put down" the latter way, the warping will be more pronounced, as explained in a preceding paragraph.

The frame is always worn at the axle-bearing flange face due to loose axle bearings. In order to use a standard axle-bearing flange it is advisable to weld this face and machine it to standard size. When welding, the beads should be "put down" perpendicular to the circumference of the bore and not with the circumference.

In welding any part of a motor frame after each

a simple spacing gage to measure the gear center distance a very efficient job of reboring can be accomplished with a single-spindle boring mill. This particular operating company started its reboring program on the Westinghouse 306 split frame motor. In explaining the procedure of machining and measuring it will be necessary to use several numerical dimensions of this motor. However, all the dimensions shown in the accompanying illustration are letters instead of numbers, so that it may be used with any motor-frame drawing.

In order to machine the housing bores of the frame so that they will be concentric with the pole bore a cast-iron drum was placed between the two halves of the motor frame. This drum was B inches in diameter. The width of this drum should be exactly 10 in. because the machinist will measure from the face of this drum to the inside housing fit on the motor frame with a pin gage. The hole through the center of the drum is to be a snug sliding fit for the boring-bar bushing.

Two holes were drilled and tapped S inches apart, D inches from the center of the drum and accurately

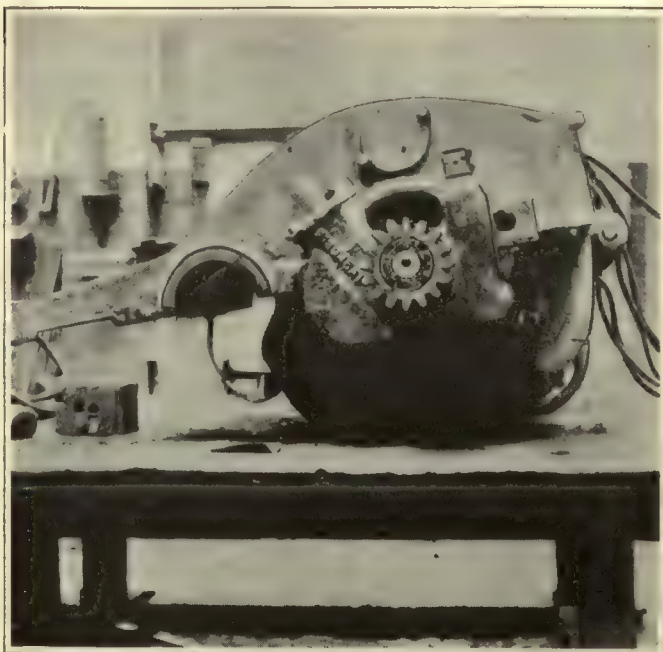
located. By means of these holes it is possible accurately to center the drum and bolt it so that the center line of the drum and the center line of the pole seat match.

The drum should be placed in the upper half of the motor frame, making certain that the center of the drum is in the center of the pole seat. It is better to have the drum closer to the pinion-end housing fit because it will increase the clearance between the brushholder box and the commutator neck. The location of the drum with respect to the center line of the pole seat measures L inches from the center of the brushholder pad. (On some motors the staggering of the brushes is produced by having the left-hand brushholder pad farther from the center of the pole seat than the right-hand brushholder pad.) If this dimension is adhered to the clearance between the brushholder box and the commutator neck will not be changed.

After the drum is bolted to the upper half of the frame the lower half is assembled, with a sufficient number of shims between the split so that a 0.017-in. feeler gage can be placed between the axle cap and the motor frame. This will insure positive clamping of the axle bearings and housings. A necessary precaution is to keep the split free from dirt and rough spots.

When clamping the motor frame on the boring-mill table the hole in the drum for the boring bar will locate the housing bore accurately. However, it is necessary to set the frame so that the parting of the axle cap will be R inches lower than the center of the boring bar. This is done so that the split of the axle bearing will be R inches higher than the split between the axle cap and the motor frame, which prevents the split of the axle bearing and the axle cap from coming at the same point. This dimension R on most split frame motors is $\frac{1}{2}$ in.

In order to insure correct armature end play so that the center line of the armature core will rotate in the center of the magnetic field it is necessary accurately

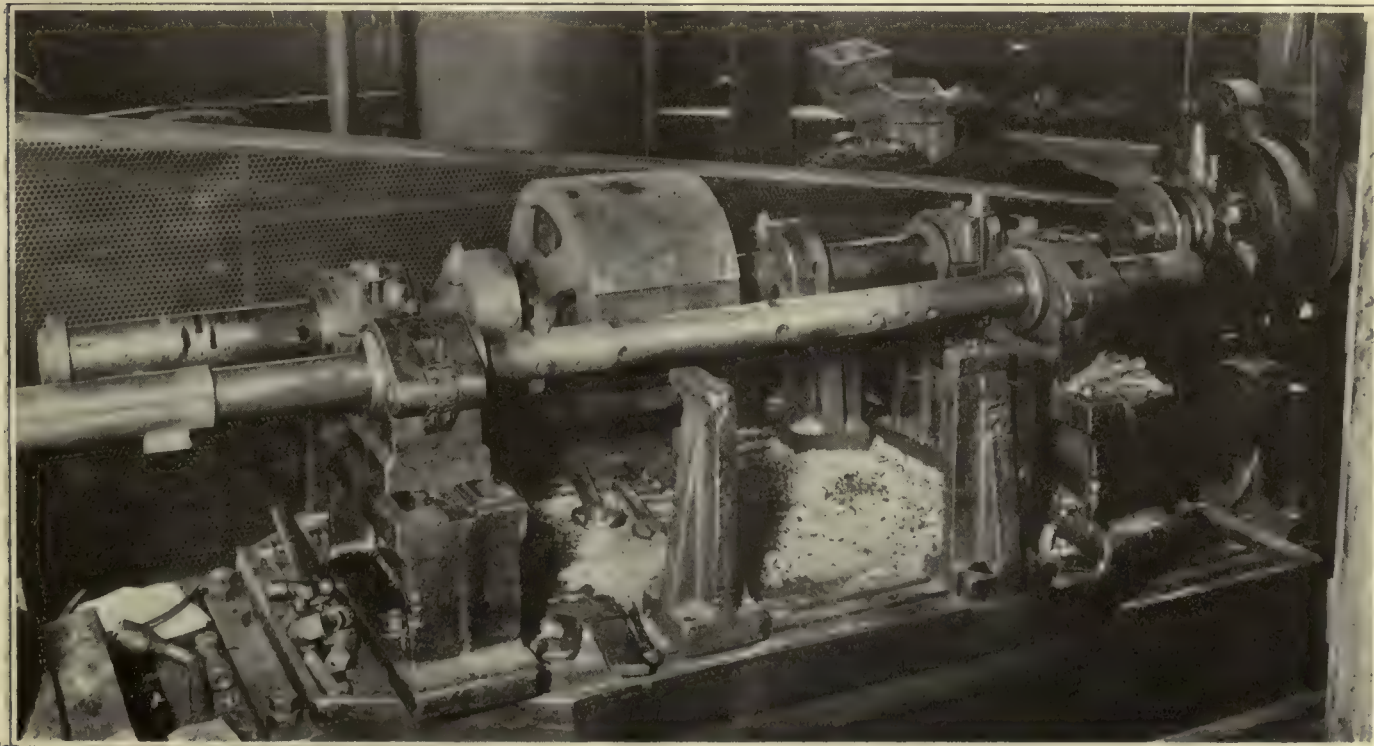


A Westinghouse 306 Split Frame Motor that Was Rebored, Welded and Equipped with Oil Sealed Housings

to machine the inside housing fits so that the dimensions E and F will not be changed. It is practically impossible to measure these dimensions after the cast-iron drum is clamped between the halves of the frame. However, if the center of the drum and the center of the pole seat coincide they can be measured in a simple manner with the pin gages M and N .

The dimensions for the pin gages to be used for the Westinghouse 306 motor are as follows:

- E = The distance from inside C.E. housing fit to the center of the pole seat..... = 16 $\frac{3}{4}$ in.
 Half the width of the drum..... = 5 in.
 M = The pin gage which measures the distance from the inside C.E. housing fit to the face of the drum..... = 11 $\frac{3}{4}$ in.



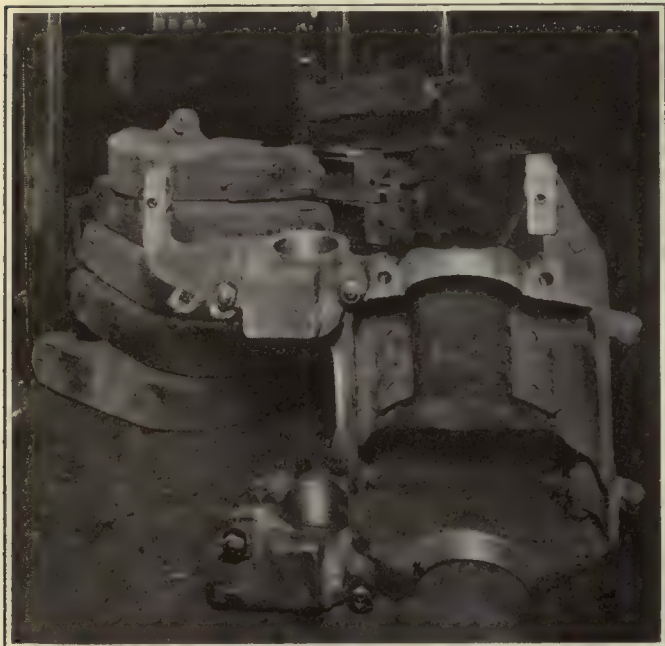
A Cast-Iron Drum, Shown Fastened to the Boring Bar of the Boring Mill, Is Placed Between the Halves of the Motor to Maintain Concentricity When Machining.

In the same manner:

- F = Distance from inside P.E. housing fit to center of the pole seat..... = $9\frac{1}{2}$ in.
 Half the width of the drum..... = 5 in.
 N = The pin gage which measures the distance from the inside P.E. housing fit to the face of the drum..... = $4\frac{1}{2}$ in.

After the pin gages have once been made they become a permanent gage for that type of motor.

It is very important that the same gear center be maintained. If it is allowed to become smaller the gear and pinion will bind. If it is allowed to become



The Upper Half of a Westinghouse 101-B Split Frame Motor and Axle Caps After Being Welded and Rebored

large the pressure will be at the end of the teeth, thus causing rapid tooth wear. In both cases the gears will be noisy.

A spacing gage provides a simple way to measure the gear center distances, as indicated in note 12 of the accompanying illustration. This gage is a simple caliper having an opening of P inches. Dimension P will be 5 in. if the housing bore A is $10\frac{1}{2}$ in. and the axle-bearing bore C is $7\frac{1}{2}$ in. It is found in the following manner:

- The radius of the housing bore A = $5\frac{1}{2}$ in.
 The radius of the axle bearing bore C = $3\frac{1}{2}$ in.
 Sum = 9 in.
 The gear center distance..... = 14 in.
 P = Distance between points of spacing gage = 14 in. — 9 in. = 5 in.

If the bore C is to be made $\frac{1}{2}$ in. oversize, then the gage will measure $4\frac{1}{2}$ in. between points. If the bore C is to be $\frac{1}{2}$ in. oversize and the bore A is to be $\frac{1}{2}$ in. oversize the gage would then be $4\frac{1}{2}$ in. between points.

The two points of this gage are used to measure the distance between the housing bore A and the axle-bearing bore C on a line R inches above the split of the upper frame. This line is the center line of the housing and axle-bearing bores. It may take a certain amount of "cut and try" machining when making the finish cut on the axle-bearing bore to insure accurate locating of the gear centers.

The following table shows the machining limits which should be adhered to on certain dimensions:

- Bore A = $-.000$ and $+.005$
 Bore C = $+.002$ and $-.002$
 Dimension T = $+\frac{1}{64}$ and $-\frac{1}{64}$
 Dimension V = $+\frac{1}{64}$ and $-\frac{1}{64}$
 Gear center = $+.005$ in. and $-.005$ in.

Chicago Men Instructed in Selling Transportation

TEN THOUSAND employees of the Chicago Surface Lines have received a course in salesmanship of transportation through a series of operating conferences held by Superintendent C. H. Evenson of the operating department from Oct. 12 to Nov. 3. Superintendent Evenson spoke twice daily, covering all depots and giving practically all trainmen an opportunity to meet their chief informally without the embarrassment of being "called on the carpet." Surface lines officials reported a good reaction from the conferences. Mr. Evenson stressed the point that the uniformed employees represented the company as far as the public's conception was concerned and their attitude was to a good measure responsible for the sale of transportation. Courtesy and neatness were requirements in getting a good reputation with the public, Mr. Evenson said. He showed the evils of intoxication and the danger of accidents in carelessness. The men were warned not to listen to malcontents but to try to be helpful to each other and to co-operate with the supervisors. They were invited to ask questions, which many of them did. This led to the introduction of a wide variety of problems for discussion. The conferences will be continued.

Northern Texas Traction Produces Novel Exhibit

FOR several years the Northern Texas Traction Company has had a feature exhibition at the annual Fat Stock Show in Fort Worth, Tex. The picture reproduced here shows the 1926 exhibit, depicting the service the interurban lines render to the community.

An added feature this year was a replica of the *Los Angeles* secured to a mooring mast, but arranged so



The Northern Texas Traction Exhibit at the 1926 Fat Stock Show in Fort Worth Was One that Carried the Message of Transportation Home to the Delegates

that it slowly revolved around the mast. This with the other small working models of transportation units attracted a large amount of attention.



Original Appearance of Track and

First Step in the Reconstruction Job

Typical appearance of Washington-Virginia tracks in Alexandria before resurfacing. Track was 9 in. low in spots and as much as 18 in. out of line at some points.

The track when excavated was retied and the vertical bends in



the rail removed by a vertical rail bender. Bends as much as

4 in. were removed in this manner. New tie plates were put on and electrically welded to the rails. Cupped joints were built up by the electric weld process and ground to a true surface.

Inexpensive Track Reconstruction Proves Satisfactory in Alexandria

When the Washington-Virginia Railway Was Confronted with a Request to Make Track Repairs and Repave Permission Was Obtained to Use an Economical Form of Construction—Cost of Track Repairs Less than One-Third that of New Construction

By C. A. S. Sinclair

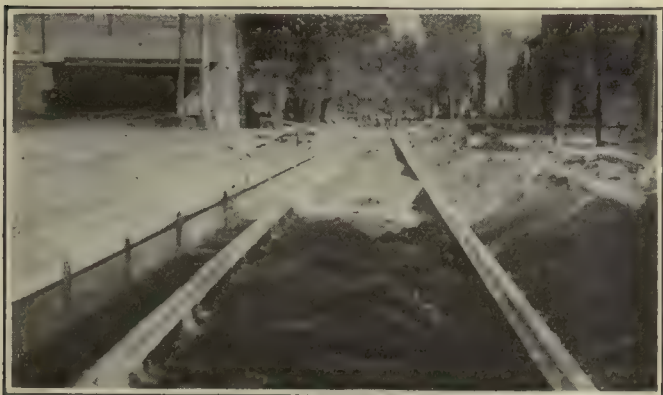
Chief Engineer Washington-Virginia Railway, Washington, D. C.

MORE than twenty years ago considerable portions of the track through the city of Alexandria, Va., were laid in dirt streets with cobblestone paving. Through the ravages of time, it well can be imagined that the street and track became in bad condition, since the entire surface had sunk considerably and unevenly. The city portion of the street was brought to the new grade by placing over it a layer of concrete, and after this had set a surface of penetration macadam was spread over the top and rolled.

Due to receivership conditions, the Washington-Virginia had to perform its portion of the reconstruction

with as little outlay of money as was possible. The following plan was worked out and put into effect last year and the first year's experience has proved that this somewhat temporary scheme has worked out satisfactorily for the light traffic conditions on this street. Both the grade and the alignment of the old track were bad and in relaying the track it was necessary to change the alignment as much as 18 in. and the elevation as much as 9 in.

First, the track space was excavated. The twenty-year-old, 7-in. girder rails were found to be somewhat surface bent at the joints. By the use of a



Placing the Gravel and Bringing the Track Up to Grade

About a 4-in. layer of bank gravel was dumped in the trench and the tracks brought to line and grade. This view is typical of one of the six jobs prepared by this temporary process in Alexandria, Va.

Before the two final layers of run-of-bank gravel were placed



on the Washington-Virginia tracks in Alexandria, Va., the city had completed laying concrete over the old cobblestone pavement at the side of the tracks, thus furnishing solid shoulders, against which the ballast and gravel fill on top of the ties was pressed by action of the 2-ton steam roller.

vertical rail bender the rail ends were straightened. New wooden ties were placed under the rails and blocked up so that the track was brought to line and grade. Cupped joints were built up by use of the electric arc and ground down to proper surface. New joint plates were then put on and electrically welded. Some of the rail ends were as much as 4 in. below the surface, but were satisfactorily brought back by the use of the vertical rail bender. A layer of run-of-bank gravel, consisting of about 50 per cent coarse aggregate and the balance sand, was then tamped under the ties. This was placed in layers averaging about 4 in. in depth and thoroughly tamped under the ties as the track was raised to its new position. The gravel used for tamping



A Cold Asphalt and Crushed Rock Mixture Was Used for the Paving

This view shows the application of the first 2-in. layer of Headly's Mixite, which is a cold mixture of asphalt and crushed rock. In the foreground can be seen the parget of small asphalt-coated rock laid against the rail web to provide a seal against the rail. A 5-ton steam roller was used to compact the paving material.



The finished surface of this section of the Washington-Virginia tracks in Alexandria appears smooth and matches the city construction in appearance. The city construction on either side of the tracks has a varying thickness of concrete laid over the old cobblestone pavement and is covered with a hot asphalt-treated rock for paving surface.

was made somewhat moist and the placing done with tamping picks.

Another layer of run-of-bank gravel was then applied and slightly moistened with water. This second layer was brought considerably above the top of the ties and was thoroughly rolled with a 2½-ton steam roller. Those portions of the track that sank, due to the weight of the steam roller, were then retamped up to position. Then another layer of gravel was applied and rolled so that the top of gravel was a uniform distance (about 4 in.) below the top of the rail. The city portion of the street had been completed before this process was attempted, so that the ballast formed a solid support against either shoulder of the street, the trench being 9 ft. in width.

PAVING SURFACE THEN ADDED

The track at this point was true to line and grade and had a well-packed, steam-rolled ballast foundation brought up to a paving space. An asphalt-type of pavement was selected that would conform to the city portion of the street paving. The city, however, used a hot application, whereas a cold application, known as Headly's Mixite, was used on the railway portion. Crushed stone was treated to a cold asphalt emulsion in one of the company's storage yards and hauled to the job by work train. This mixture was deposited in the track from center dump cars and spread in place. This asphalt-coated stone was laid to a depth of 2 in. and was rolled with a 5-ton steam roller. Just ahead of this job a gang was kept busy painting the side of the rail with asphalt and pargeting the wet surface with

rolled again with the 5-ton roller. This furnished a surface equal in appearance to that of the street sides paved by the city.

The expense incidental to all of the trackwork on this reconstruction job covering six city blocks was \$2.25 per foot of single track, or less than one-third of the cost estimated on the basis of reconstruction with new rail. The paving surface cost \$2.40 per foot of single track, the total charge of reconstruction costing only \$4.65 per foot. After nearly a year's usage, with 30-ton cars passing over this track on headways of 7½ minutes in the rush hour to 15 and 20 minutes in the off-peak period, only slight depressions have developed, which were easily patched by the addition of small amounts of asphalt-coated stone. This patching material, being the same as that originally used, does not give a patched effect.

What the ultimate life of this class of work will be is of course not known. There is this important consideration, however. When repairs do become necessary, there is no loss of original material. The gravel can be used again with only slight additions, and the asphalt-coated stone, with the addition of fresh asphalt, can also be used. With the lower cost of digging out this class of material only a small labor charge is needed to make extensive repairs.

There is no question but what this class of construction is much inferior to that with a concrete base, but the results so far obtained indicate that a satisfactory life will be gained under light traffic conditions when money for more permanent type of construction is not available.

Maintenance Notes

Fixture for Grinding Grid Faces

PROPER contact between adjacent grid bosses is very essential in the assembly of car resistors. To insure accurate grinding of grid contact faces the Department of Street Railways, Detroit, Mich., uses a special attachment for the grinder. A brass face plate with iron center is used for the surface against which the grid is held. The center boss projects so that the hole at the end of the grid will fit over this. In grinding, the grid is held magneti-

cally against the face plate. This plate with the magnetizing coil is mounted on a rod attached to the grinder so that the whole fixture will swing in toward the grinding wheel. Pressure horizontally against the face of the wheel is produced by turning a hand wheel to work a screw drive.

In the operation of grinding the grid is placed against the face plate and the movement of swinging this in to the grinding wheel closes the circuit through a coil on the back of the face plate so as to create a magnetic circuit and hold the grid

firmly in position. As soon as the fixture has been swung in to proper position, the operator turns the hand wheel and so brings the boss of the grid against the grinding wheel. The work can thus be carried out rapidly and without danger of the grid face being held at an angle so that improper grinding would result.

Raising Low Joints on Open Track

BY D. H. WALKER

Assistant Engineer T. H. I. & E.
Traction Company

DURING the last two years the track forces on the Terre Haute, Indianapolis & Eastern Traction Company have used a vertical joint straightener for removing the surface bends at low joints. This device, consisting essentially of an I-beam, screw jack and clevis, has been very successful in eliminating low joints and improving the riding quality of the track. The rail bender was originally devised by W. A. Coleman, superintendent of the Dayton & Western, and used by him on that property. Several benders of the same style as his were made in our shops and tried out and now each division is equipped with these.

In operation this bender is handled by a gang of three or more men. With two men to operate the bender and the foreman to sight the joints an average of about 40 joints per day can be secured, but a crew accustomed to handling the apparatus will average nearer 60 joints per day. This device will straighten the plates as well as the rail. The rail and plates are not simply sprung up, to go back again under the first wheel load, but are actually bent back to original position.

The joint is first dug out and then all bolts tightened. Any necessary bolt renewals are made and the plates then fitted snugly and tightened. Two 1½-in. square steel bars about 10 in. long are then placed on the head of the rail and as near as possible to the ends of the surface bend showing in the rail and the joint plates. The distance between them will thus vary with the degree



A Special Attachment to a Standard Grinder Is Used When Grinding the Contact Face of a Resistance Grid

of surface bend in the joint. If it appears that the bend is mostly in the joint plates these bars should be placed near the end of the plates.

A 10-in. I-beam about 6 ft. long is next placed on the two square bars and a bell-base, three-way-head screw jack of 12 or 15-ton capacity placed on the I-beam and directly over the joint. The next piece to be applied is an assembled yoke of three members. Two steel rods $1\frac{1}{2}$ in. in diameter are run through a steel bar 13 in. x 4 in. x 2 in. Each rod is threaded 12 in. on the top and equipped with three hexagonal nuts, two above the bar and one below.

The steel rods have forged eyes in the bottom end with an opening of 2 in. They are 3 ft. 6 in. long from tip of the eye to top of rod and are spaced 8 in. apart through the 13-in. long steel bar. The steel bar has a slightly raised nipple in the center of



Screw Jack Exerts 15 Tons Pressure to Straighten Low Joints on T. H., I. & E. Lines

the bottom between the two rods. This nipple fits in the head of the screw jack and centers the yoke. The eyes in the rods are turned parallel to the rail and a 12-in. long steel rod of $1\frac{1}{2}$ in. diameter is thrust through the two and directly under the center of the joint.

The foreman then sights down the rail from a distance while pressure upward is slowly applied through the jack. We have found that the joint should be raised $\frac{1}{4}$ in. to $\frac{3}{8}$ in. above level, which will make it secure and stiff. The foreman sighting the joint should then be sure rails and bars are straightened after the jack pressure is removed. In some cases it is necessary to apply the pressure a second time, as when the jack is released the joint will spring down again, not having been sufficiently bent. It is very necessary to be sure that the joint is bent back be-

Dick Prescott Is Promoted And Indulges in Reverie



WHEN Dick Prescott, engineer of equipment of the Consolidated Railway & Light Company, and Thomas Mullaney, general foreman, started back to the shop from their visit to the general manager's office they were still somewhat dazed from the surprise to which they had been treated. Mr. Milburn had dictated, in their presence, an executive bulletin promoting Mullaney to the position of superintendent of equipment and making Dick his assistant.

The general manager had been most inspiring as he outlined his hopes and aspirations for the property. He dwelt particularly on the importance of the new idea of selling transportation by improvement of the product itself and pointed out the importance of developing and improving the rolling stock equipment on the property to make it more attractive to passengers.

He complimented Mullaney and Dick on their progressive views as illustrated by the report on maintenance practice that had been submitted to the operating staff.

They returned to the shop filled with new ambition and enthusiasm. Dick, who had entered the electric railway business through necessity rather than choice, was still unable to believe that he had won recognition and promotion so quickly. As it was late in the afternoon when they arrived at the shop, he left Mullaney to clean up his desk, finished up his own work and proceeded home.

Dick's mother was delighted at the good news. They discussed the details

of the day's events happily at dinner, and Dick then went into the little living room to enjoy his pipe and read a book.

But his mind refused to follow his eyes, and soon he resigned himself to the eager thoughts that crowded in on him. He began to visualize the opportunities that lay ahead because of the very difficulties in the present railway situation.

Many plans and ideas tumbled through his mind in delicious confusion. He had already won the confidence and friendship of most of the foremen in the Consolidated shop and he now contemplated with pleasure the prospect of building on that a spirit of teamwork which would have for its ultimate objective the winning of public good will and patronage.

"Every Man a Salesman of the Company," thought Dick, "would make a good slogan for the shop to lead off with. That would help to inspire the right kind of thinking and would add to the day's work the pleasure of accomplishment instead of making it a burden of necessity.

"I'm convinced that Mr. Milburn has a wonderful idea," he continued in thought. "Street cars can be made more attractive through improvement in design and better maintenance. If we can do the job right it will not only be a real service to the public in this city but it will win recognition and satisfaction for every man in the outfit."

In this spirit Dick finally turned in for the night, eager for morning and the job ahead.

fore the joint and shoulder ties are tamped.

By burning or drilling holes in each end of the I-beam web it is possible for the men to carry it easily from joint to joint by means of lining bars or crowbars thrust through.

In our first experience with this joint straightener we tamped the shoulder ties while the pressure was still on and found that some joints went back down because they were only sprung up. Removing the pressure before tamping overcomes this difficulty, however. Great care must be taken that the joints are not raised too high, as this will cause track even more rough than that due to the low joints. In such a case the joints must simply be dug out and lowered and traffic will then in time beat them down again.

During cold weather, when the rails are chilled in the mornings and there would be danger of snapping them under pressure, heat is applied to the joint before bending. Several devices were used on the different divisions, but each was, in effect, a grate built to fit over the rail and with a fire carried in the grate by means of sheet iron sides. Handles were provided to carry this from joint to joint. Blow torches were tried, but did not prove successful.

In the hands of a foreman who is careful this device will work wonders in improving the riding quality of track. On the 70-lb., 80-lb. and 85-lb. A.S.C.E. rail in our suburban track it is very effective, but we have not tried it much on anything heavier.



The Operator Uses a Respirator While Spraying the Interior Headlining

Spray Painting Inside Cars

ONE of the few electric railways in the country to use spray painting for headlinings inside cars is the New York, Westchester & Boston, New York City. A white enamel is used and J. T. Hamilton, master mechanic for the railway, reports that a much more satisfactory job is obtained than by brush.

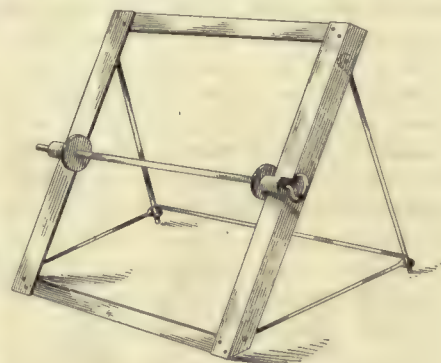
By using the spray method the time of painting headlinings has been reduced about 50 per cent. There is a slight increase in the amount of material used. Before the paint is applied the headlinings are

scrubbed with a cleaner and then washed with clean water. One coat of white enamel is then sprayed on.

When the railway changed to the spray method for painting the exteriors of cars the time was reduced approximately one-third below that taken by the brush method. Paasche type air brush and spraying equipment is used. The cars are all steel and are 67 ft. long.

Portable Pay-Out Reel Stand

MOST electric railway linemen have experienced trouble from the use of the usual pay-out reel stand on which coils of wire are placed in a horizontal position. Unless particular care is exercised in pulling the wire from the reel several turns will drop down off the side



Improved Type of Pay-Out Reel Stand

and these are sure to catch in something to cause annoyance and delay. These troubles have been solved by A. A. Riley, supervisor of the stores department for the Columbia Gas & Electric Company, who has devised a stand made with a pipe and angle framework, which can be folded up easily so as to take little space on the line truck.

The angle frame is 36 in. wide and 42 in. high. All of its joints are welded. The sides are made of 3x3x $\frac{1}{4}$ -in. angles and the top and bottom are 2x2x $\frac{1}{4}$ -in. angles. The legs or back supports are made of 1-in. wrought iron pipe. Two tie-rods at the bottom are made of $\frac{3}{8}$ -in. round iron. The pipe supports are hinged at the top of the frame and the tie-rods are hinged at the bottom and have eyes forged on the loose ends. The pipe supports are set into these eyes so as to form a rigid framework.

As an axle for the cable reels an old Ford driveshaft is used. A handle is welded to one end and the axle is supported on forged hubs, which are welded to the side angles of the framework.



Time for Painting Exteriors of Cars Was Reduced One-Third by the Spray Method

A reel is placed in position by putting the framework over it and then placing the axle in position through the center hole. The framework can then be raised and the bottom of the back-supporting pipework placed in the eyes of the tie-rods. This stand takes up little space and can be set up anywhere that is most convenient for carrying on the work.

Changing a Single-Track Line to Double

RECONSTRUCTION of the Dunbar route of the British Columbia Electric Railway, Vancouver, Canada, to provide double tracks, which is now taking place, requires 6.1 miles of new rail and an expenditure of \$200,000. In doing the work certain sections had to be reggraded before the track could be shifted to one side to make room for the steam shovel used to excavate the trench for the new track foundation. A road gang followed the shovel and loaded ballast from the roadbed of the old track to be hauled to points where new ballasting was being done.

A fine grading gang followed. They set up the form boards for the concrete slab foundations of the new track and trimmed the subgrade to a uniform surface. This was gaged to correct depth and cross section by use of a template board. Track-laying gangs completed the work.

Roller Bearing Armature Baking Rack

NO ONE wants to spend much time getting material in and out of a good-sized baking oven, especially during a St. Louis summer. Besides, it isn't economical. For this reason an armature rack was constructed in the shop of the United Railways of St. Louis which even when loaded to its capacity of 25 armatures can almost be operated by a child.

The general construction can be seen from the accompanying view. The rack proper is constructed from structural steel and mounted on two axles with small flanged wheels rolling on rail set in the floor. It is mounted on the two axles using Hyatt roller bearings. Although the truck has been used daily in and out of the bake oven the bearings remain very efficient in reducing the roller friction of the truck. On account of the heat no oil is used, but



This Rack Has a Capacity of 25 Armatures and Can Be Moved Easily Due to Use of Roller Bearings

a graphite dressing was applied to the roller surfaces when installed. Nothing has been done since that time.

To start the truck out of the oven a ratchet arrangement has been attached to the axle in the foreground, which is operated by the handle seen on the front side of the truck. A single pull on this ratchet starts the truck rolling forward and once started it can easily be pulled by one man the rest of the way even when loaded to capacity with armatures. The bake oven doors are thus open for a minimum of time through the use of this truck.

Oil Furnaces Replace Coke Forges

MATERIAL improvement in the quality and quantity of work produced in the blacksmith department of the Department of Street Railways, Detroit, Mich., has been brought about through the installation of six new oil-fired forging furnaces in place of coke-fired forges. A carbonizing furnace with pyrometer equipment has also been added. An advantage found from the oil-fired furnaces is that there is much less danger of burning the material than where coke-fired forges are used. As



Heating Picks Preparatory to Repointing in One of the Oil-Fired Furnaces



General View of the Blacksmith Department with Oil-Fired Furnaces Installed by the Department of Street Railways, Detroit, Mich.

a result more material can be placed in the furnace at one time and so the various laborers are kept busy at their anvils instead of standing around waiting for the material to reach the desired temperature. Very little difference is found in the cost of heating material by oil as compared with coke, but the blacksmith department is much freer of smoke and fumes and there are no coal or

ashes to handle with oil-fired equipment.

The new oil furnaces were supplied by the Ferguson Furnace Company, Toledo, Ohio. The oil supply was piped up and air connections were made to the blowers. The old down-draft forges were provided with a suction line so these were disconnected and the new furnaces were hooked up to this.

New Equipment Available

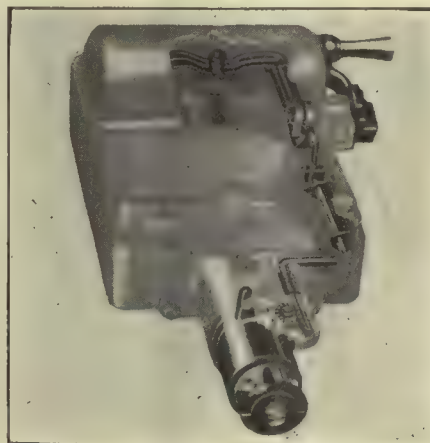
Interlocking Plugs with Safety Switches

FOR use with portable electrical appliances, such as welding machines, track grinders, rivet heaters and other motor-driven machines, used by electric railways, a safety switch with fuse has just been placed on the market by the Crouse-Hinds Company, Syracuse, N. Y., in which it is impossible to withdraw the plug or open the door of the compartment unless the switch is open. Interlocking also provides that the switch cannot be closed unless the plug is fully inserted and the door of the fuse compartment closed.

The switch and plug interlocking mechanism is simple, consisting of a rack and pinion with a spring, rod and catch which engages a segment on the rocker arm of the switch. The switch door interlocking mechanism includes a lug on the hinge of the door, which also engages a segment of the rocker arm of the switch.

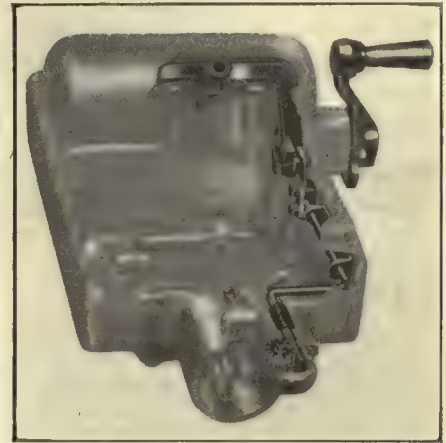
The plug interlock consists of a wing nut and I-bolt on the housing, which engages a forked lug on the plug handle. This prevents accidental withdrawal of the plug due to the weight of the cable even when the switch is open.

The plug contacts are protected by a shell or sleeve which is cast as an integral part of the aluminum



Switch Closed with Plug Locked In

handle. This is strong enough that the plugs are able to withstand unusually hard usage. The plugs and receptacles are polarized and the contacts are self-aligning. The insulating parts of both plug and receptacle are held in place without



Plug Removed, Switch Locked Open

screws and cannot become loosened by vibration. Electrical contact is maintained between the interlocking device in the conduit and the shell of the plug, which effectually grounds the plug to the conduit system.

New Line of Relays

TO SUPERSEDE the Imperial type relays a new line, Type S-R, has just been placed on the market by the Roller-Smith Company, New York, N. Y. Improvements in these relays include longer scales, which insure greater accuracy; increased torque and a type of case to match standard lines of indicating instruments.

These relays are for use on either direct or alternating current circuits and include relays for reverse current, overload, underload, closed circuit underloads, over-voltage and under-voltage. The instrument mechanism has a platinum spring contact attached to its pointer which co-operates with a similar one carried by an externally adjustable pilot needle. The pilot needle is set by means of a slotted head button projecting from the front of the relay case. The circuit established on engagement of the contacts energizes an electromagnet which is mounted below on the same base with the instrument. The switch operated by the electromagnet effects whatever external circuit change the relay is designed for. The construction provides a much wider range of adjustment than heretofore available.

Association News & Discussions

Midwest Association Holds Spirited Meeting in Denver

High-Grade Program of Management and Technical Subjects Provokes Lively Discussion at Three-Day Meeting—Improvement of Railway Service to Compete with Automobiles Receives Attention

MORE than 200 railway men and their ladies from the states of Missouri, Colorado, Oklahoma, Arkansas, Nebraska and Utah put in an active three days in spirited discussion of current local transportation problems during the annual meeting of the Midwest Electric Railway Association on July 8, 9 and 10 in Denver, Col. Despite the weight of current difficulties and the depletion of railway revenues by automobile competition, there was manifested an atmosphere of confidence toward the future and a determination to find ways and means of popularizing common-carrier transportation so as to win rates of fare adequate to make operations profitable.

Prepared papers and addresses were presented on various managerial and technical phases of railway operations. These included the following: "Fares and Fare Collection Methods," by B. W. Frauenthal, general traffic agent United Railways, St. Louis; "Modern Maintenance of Equipment," by R. W. Bailey, superintendent of power and equipment Kansas City Railways; "Effect of the Automobile on Mass Transportation," by E. E. Stenger, president Denver Tramway Corporation; "The Human Element in Industry," by F. G. Buffe, general manager for receivers Kansas City Railways; "The Interurban Bus," by B. W. Arnold, general manager Chicago, North Shore & Milwaukee Railroad; "The Industry Needs a Modern Business Viewpoint," by Charles Gordon, editor *ELECTRIC RAILWAY JOURNAL*; "Progress in Track Construction," by

Nelson R. Love, chief engineer Denver Tramway Corporation. At the annual banquet, held on Saturday night among delightful surroundings at the Denver Motor Club, situated high in the mountains west of Denver, Frank R. Coates, president American Electric Railway Association, was the guest of honor and principal speaker. His address and the papers by Messrs. Bailey and Love are abstracted elsewhere in this issue. The papers by Messrs. Frauenthal, Buffe and Gordon will appear later.

PAPERS ACTIVELY DISCUSSED

In his opening remarks and response to the welcome extended by Mayor Stapleton of Denver, President Robert B. Campbell expressed confidence for the future. He strongly urged the need of conferences and serious discussions among railway executives, looking to the frank interchange of experience and ideas. He particularly emphasized the value of discussion from the floor to supplement prepared papers and addresses on the program. As a result, each of the subjects presented provoked much questioning, comment and debate.

"Fares and Fare Collection Methods" was discussed by A. E. Reynolds, Springfield, Mo.; Aldon J. Anderson, Salt Lake City; F. S. Welty, Omaha, Neb.; H. S. Robertson, Denver, Col.; A. Blunk, St. Joseph, Mo.; D. L. Fennell, Kansas City, Mo.; H. W. Patten, Wichita, Kan.; B. Hillburn, Tulsa, Okla., and F. G. Buffe, Kansas City, Mo. Mr. Anderson outlined the experience in Salt Lake City with the weekly

pass following an increase in the single-ride fare. He said that this had resulted in doubling the sale of \$1.25 weekly passes. Mr. Welty emphasized the importance of simplicity in transfers for one-man operation and Mr. Robertson described the methods used in Denver to keep transfers simple. Mr. Blunk discussed the problems of transfer handling for pay-leave operation in comparison with pay-enter. Mr. Fennell took the position that transfer punching should be held to a minimum under any conditions, since excessive punching slows down two-man operation as well as one-man. Mr. Patten discussed the use in Wichita of three different transfer colors for various periods of the day.

On the use of tickets, Mr. Hillburn said that in Tulsa an effort is made to build ticket sales to a maximum for the purpose of combating jitney competition. He favored a large differential in price between cash and ticket fares. Mr. Buffe decried the tendency to split pennies in fare collection and strongly advocated simplicity in the fare structure.

Many features of Mr. Bailey's paper on maintenance practice provoked questions and discussion. In presenting his ideas Mr. Bailey said that he had considered primarily the maintenance of existing equipment to meet modern requirements, since there is not enough modern equipment in service to talk about. In answer to a question from John Sutherland, master mechanic Tri-City Railway, Davenport, Mr. Bailey said the reduction in pull-ins recorded in his paper amounted to an increase in miles per pull-in of from 1,500 to 5,000. Other questions were raised relative to the experience of Kansas City in reducing bolt breakage. Mr. Bailey said that the automotive industry had learned in the past that upset head bolts without a fillet under the head are unreliable. As an important step in eliminating bolt breakage he



More than 200 Railway Executives and Their Ladies Attended the Fourth Annual

explained that the lengths of wrenches used with various sizes of bolts are standardized. Workmen are not permitted to use any other wrenches, and the use of a pipe on the handle is forbidden.

Reduction in the amount of lubricants used in Omaha following improvement in maintenance practice was mentioned by Mr. Welty. Mr. Bailey and R. S. Neal explained the design of die cast bearings to prevent breakage of the flange. Mr. Neal said that the secret of success lay in maintaining certain proportions between the height of the bearing flange and the body of the bearing to prevent excessive strain being set up in the metal. H. Detrick, master mechanic Denver Tramway, mentioned the importance of giving increased attention to the reduction of noise on cars. Fred Steffens, master mechanic St. Joseph Railway, Light, Heat & Power Company, said that their practice was to keep the same set of pinions and gears together throughout their life.

COMMUTATOR LEADS SWEDGED

Other questions were directed at Mr. Bailey regarding the swedging of commutator leads. He replied that the process cost about the same as soldering, but had entirely eliminated open circuits. Mr. Gustavson of the Westinghouse Electric & Manufacturing Company also discussed this practice. He favored the method and stated that reports made to his company by John S. Dean had also been favorable. He pointed out particularly the ease with which leads may be replaced by swedging in comparison with soldering.

Speaking on "the effect of the automobile on mass transportation," E. Stenger, president Denver Tramway Corporation, called attention to the automobile's influence on the trend of transportation development. "From the beginning of transportation," he said, "the tendency has been consistently toward economy. The growth of rail transportation was in this direction, and the resulting effect of economical facilities for the movement of passengers and commodities led to the development of modern communities which are dependent for their existence on economical and speedy transportation.

"With the automobile has come a new form of individual transportation. It has been thrust upon us suddenly and

COMING MEETINGS

OF

Electric Railway and Allied Associations

July 22—New England Street Railway Club, annual outing, Portland, Me.

July 23-24—Central Electric Railway Accountants' Association, meeting, Drake Hotel, Chicago, Ill.

July 28-30—Electric Railway Association of Equipment Men, Southern Properties, semi-annual meeting, Chattanooga, Tenn.

Aug. 11—Metropolitan Section A.E.R.A., annual outing, Pelham Bay Park, New York.

Aug. 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

its growth has been phenomenal. As a transportation problem the automobile is distinctly an American problem, since its use is comparatively limited outside the United States. Even in this country the conditions which it brings about vary with cities of different size. Because of the rapidity of automobile development it is impossible to look far into the future or to forecast its ultimate effect on community life and other transportation agencies.

"Growth of the automobile is not in line with the previous trend toward economy. Other factors have dictated its widespread use. Similarly, the automobile has an opposite effect on community growth than have the railroads,

since it is leading to decentralization rather than concentration of population. Thus, today, there are two strong opposing transportation forces.

ECONOMY HAS BECOME SECONDARY

"Centralization of communities leads to many economies. These are chiefly apparent in utilities, police and fire protection, etc. The opposite tendency acts against community economy."

Mr. Stenger outlined the results of careful surveys in Denver to indicate that the convenience of access to car lines alone has little influence on choice between cars and autos for local transportation. He expressed the opinion that pride or social distinction may be an important influence. Summarizing, he said: "There is going on a fundamental change in the nature of transportation demand. In looking for a solution of the difficulties of common carriers we must strike out along new lines. It is impossible to guide the future on the experience or precedents of the past."

Discussing Mr. Stenger's remarks, Mr. Welty advocated the elimination of parking as an aid to the situation. Mr. Buffe called attention to the experience of Denver as a striking illustration of the need for even more intensive effort to meet automobile competition. "Although Denver has gone as far as any property in the Midwest, Association territory in carrying out the principles of improvement which we are all advocating," said Mr. Buffe, "the situation still seems to present a paradox and illustrates the need for still more careful analysis of the factors which influence railway riding. Commenting on Kansas City's experience, he said that the social appeal of the bus as operated there does not offer a solution, since the buses have taken their passengers largely from former street car riders.

MERCHANTS DON'T RECOGNIZE PARKING EVIL

On the subject of parking elimination, he remarked that railway receipts in Kansas City had jumped \$750 per day during one week of anti-parking regulation. Downtown merchants are loath to recognize the facts of parking, however, and have a strong tendency to work against their own best interests. A survey of the shopping district in Kansas City showed that if



Meeting of the Midwest Electric Railway Association at Denver July 8-10, 1926

all parked cars carried two shoppers the total would amount to 2,000 customers. Street cars, on the other hand, carried 10,000 shoppers to the downtown district.

Further discussion of the merchandising of electric railway service ensued. Mr. Reynolds illustrated the need for advertising, from experience during the national Rotary Club convention in Denver. "With an average minimum automobile transportation cost of 11 cents per mile," he said, "the railways have an excellent opportunity of competing on a favorable basis." Mr. Gordon commented on the difference between a constructive car ride selling campaign and an appeal for relief of the railway as such, or an attempt directly to influence the use of automobiles. Mr. Fennell said that automobile dealers' associations usually object strenuously to any attempt to increase car riding.

CHANGE IN ATTITUDE OF MANAGEMENT

F. G. Buffe's paper on "The Human Element in Industry" was received with acclaim and provoked many favorable comments. A complete abstract will be published next week. In the discussion Mr. Stenger remarked that there has been a decided change in the attitude of management toward labor. "Today," he said, "the relations are square on a man to man basis, and management has learned that best results are thus obtained."

Due to the absence of B. W. Arnold, assistant general manager Chicago, North Shore & Milwaukee Railroad, his paper on interurban bus operation was read by President Campbell. "The time has passed," said Mr. Campbell, "when we can say 'to hell with the bus.' Buses can't be operated on the same basis as electric cars and we have to pay for the experience of learning where and how to operate them."

MENTAL FLEXIBILITY NEEDED

"Flexibility in our mental attitude and open-mindedness toward the best methods of organizing and utilizing the bus or motor coach as a transportation tool should characterize our entrance into this broadened field of transportation," said Mr. Arnold in his paper. "I feel that we are only on the threshold of bus development," he added. "The operation of motor coach service has three functions to perform—properly to serve the territory adjacent to the railroad property, to add revenue to the railroad and to create and maintain improved public relations."

"In this era of prosperity, which is providing almost every family with an automobile, it is necessary, if we are to make motor coach operation a success, to demonstrate the many advantages of this form of transportation. Its service must be made dependable, safe, clean and rapid. Schedules must be carefully studied before installation and must then be rigidly maintained. Business must be solicited for coaches just as for railway lines. One additional passenger per trip frequently spells the difference between profit and loss."

"Our chartered coach business has been a large factor in carrying the cost of pioneering new lines. Every lodge,

club, real estate firm or private party is a prospective customer for chartered business that can be handled in off-peak periods. Highway development makes possible the operation of long coach trips. The North Shore Line has sent chartered coaches from Chicago to New York and the White Mountains.

DRIVER SELECTION IMPORTANT

"Driver selection and training is of paramount importance to successful coach operation. There is more of the personally conducted tour atmosphere to a coach ride than on a railroad, and the driver is a large element in the success or failure of the trip. Selection of proper equipment follows closely in importance. Garage facilities, cleaning, inspection and maintenance are contributory to success or failure."

"Rates on the North Shore feeder coach lines are on the basis of 3.6 cents for tickets and 4 cents cash. At all main line stations the agent handles motor coach tickets and stations are used jointly by railroad and motor coach. At other than railroad stations arrangements are made with drug stores, hotels, etc., to handle tickets on a commission basis and provide suitable waiting room space and toilet facilities for patrons."

Mr. Arnold summarized the basis of all successful transportation operation, whether railway or motor coach, by saying, "If you are pessimistic as to the future of the transportation business don't get in; if you are in, get out."

MILEAGE CONTRACTS QUESTIONED

The practice of purchasing tires on mileage contracts was questioned as a sound business proposition by Mr. Bailey. He said that under present conditions of keen competition among manufacturers it is possible for railways almost to write their own tire contracts. He expressed the opinion that it would be only a matter of time before this practice would be abolished. Mr. Campbell differed with Mr. Bailey and maintained that purchase of tires on a mileage basis is a perfectly proper and practicable arrangement. In defense of his views, Mr. Bailey maintained that unless manufacturers could make a profit on such contracts this practice could not be continued. He held that if, on the other hand, manufacturers did make a profit on such contracts operators could save money by instituting their own tire service. Considerable discussion ensued regarding the design of bus tires, size of wheels and performance of brakes. Mr. Bailey said that elaborate tests which have been conducted in Kansas City to obtain data on the performance of tires and brakes will be ready for publication in the near future.

A MODERN BUSINESS VIEWPOINT

"The Industry Needs a Modern Business Viewpoint" was the subject of a paper by Charles Gordon. This was supplemented with remarks concerning the need for improvement in electric railway cars. Mr. Gordon also explained the work of the American Electric Railway Association committee on essential features of modern cars, which has just rendered its re-

port and which was published in abstract in the June 26 issue of *ELECTRIC RAILWAY JOURNAL*, page 1086. In answer to questions, the relation between the work of this committee and the committee on unification of car design was also explained. Considerable discussion arose as to the condition of existing electric railway equipment and the need for new cars in the industry. The significance of the effort in Grand Rapids to popularize electric railway service by providing a character of equipment which would have a strong appeal to prospective riders was also discussed. The basis of the surveys made by *ELECTRIC RAILWAY JOURNAL* on the age of cars was questioned by Mr. Welty. In answer to this, Mr. Gordon explained that the age of cars was in itself of little significance except as it is combined with the developments which have taken place in car construction since existing cars were put in service. Mr. Bailey commented on the difficulty of obtaining the necessary money to provide new cars even though the improvements available warrant substitution of new equipment for that now in service. He said that estimates made by the electrical manufacturers of the savings to be effected by new equipment in Kansas City did not show a profitable financing basis.

Mr. Blunk of St. Joseph cited the predicament of the small operator in purchasing new cars. He said that the small property which cannot afford the development cost of special cars is forced to take equipment offered by the car builders and that the selection is usually limited to duplicates of recently completed orders for larger properties. Mr. Campbell reported the experience of Coffeyville, Kan., where he said that according to L. L. Francis, secretary and manager, five new cars are paying for themselves through decreased operating cost and increased revenue. Mr. Bailey reported plans in Kansas City to test out thoroughly the possibilities of improved cars in attracting patronage.

CONTINUED DEVELOPMENT IMPORTANT

The responsibility of the car builder in bringing about car development and the advantages which would follow the general acceptance by railway operators of more uniform types of cars manufactured for stock by various builders was pointed out by Mr. Gordon. He emphasized, however, the importance of avoiding any arrangement which would tend to stifle development. H. R. Gass, sales engineer St. Louis Car Company, explained the difficulty which confronts the car builder in bringing about orderly development and reduced cost of cars. "In the past ten years," he said, "it has been impossible not only to sell the same type of car to more than one property but even to sell the same car more than once to the same property. The resulting development cost," he said, "has a decided influence on the cost of cars. Operators have adopted the practice of specifying their equipment in most minute detail and there has been little opportunity for the manufacturer to take the initiative in development." P. H. Conroy, sales

engineer Tool Steel Gear & Pinion Company, declared that the industry has been asleep to the need for developing attractive cars. He particularly called attention to the tendency to provide seats that are too narrow and uncomfortable.

D. L. Fennell commented on the co-operation of the technical papers in making the Midwest Association a success, and in response to a vote of thanks for the work of *ELECTRIC RAILWAY JOURNAL* in behalf of the association and the industry Mr. Gordon expressed confidence in the ability of the industry to overcome existing difficulties.

PROGRESS IN TRACK CONSTRUCTION

The paper by Nelson R. Love on "Progress in Track Construction" aroused much interest in the possibilities of improving existing construction practice. Mr. Love described the use of a single-truck car equipped with grinding bricks for removing rail corrugation and said that this method was approximately one-tenth as costly as the former grinding equipment used. In answer to questions, Mr. Love explained further the process of grinding rolled steel wheels in Denver to maintain approximately accurate contours during their life. In answer to questions by Messrs. Bailey and Blunk, he said that the section of flexible track now in service in Denver is still in the experimental stage and has not been adopted for standard construction. He also commented on the use of carbon arc seam welds and pointed out that this practice permits the same equipment to be used for special work repairs, building up cupped joints, etc.

The following officers and members of the executive committee were unanimously elected for the ensuing year: President, A. E. Reynolds, vice-president and general manager Springfield Traction Company, Springfield, Mo.; vice-president, H. B. Cobban, secretary-treasurer and general manager Northeast Oklahoma Railroad, Miami, Okla.; secretary-treasurer, J. A. Weimer, superintendent of transportation Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo. Executive committee to fill expiring terms: R. A. Leussler, general manager Omaha & Council Bluffs Street Railway, Omaha, Neb.; H. W. Patten, general superintendent Wichita Railroad & Light Company, Wichita, Kan.; Bert Hillburn, general manager Tulsa Street Railway, Tulsa, Okla.; S. B. Irelan, general manager St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.; R. B. Campbell, secretary-treasurer and general manager Arkansas Valley Interurban Railway, Wichita, Kan. Executive committee members with unexpired terms who continue in office are: R. J. Lockwood, assistant manager for receiver United Railways of St. Louis, St. Louis, Mo.; F. G. Buffe, general manager for receivers Kansas City Railways, Kansas City, Mo.; Ernest Stenger, president Denver Tramway, Denver, Col.

F. R. Coates, president of the American Electric Railway Association, was elected a life member of the Midwest Association by unanimous vote. An invitation was extended by Mr. Hillburn

to hold the next meeting in Tulsa, Okla. This was referred to the executive committee. A vote of thanks was extended to the various speakers who

prepared papers and to the officials of the Denver Tramway and their ladies, who provided an excellent entertainment program during the convention.

Transportation Must Be Put on a Profitable Basis*

Greater Co-operation Between Utilities Is Needed—Buses Are Not Destined to Replace Railways—New York Needs to Divorce Transportation and Politics

BY FRANK R. COATES

President American Electric Railway Association

PRIMARILY I want to make a plea for closer co-operation of all branches of the utility business. Utility men outside the local transportation business can be of great assistance to us by helping tell the public the facts about our situation. I use the word "situation" because I dislike the term "problems," which has so frequently been applied in recent years to local transportation matters. The fact is, there have been no great variety of so-called "problems." Just one or two fundamental economic questions have had to be answered in every community. Where these have been answered in the right way local transportation has got back on its feet, good service has been rendered and companies and communities have prospered. Where these questions have not been answered fairly or fully transportation still is crippled. Furthermore, it is likely to be for some time to come.

The outstanding questions to be answered by every community in connection with its local transportation are these: First, is there a demand for public transportation, and, second, if there is this demand, shall the local company be permitted to earn a fair return on its investment?

As to the first question, is there a demand for common-carrier transportation, we are likely to answer it quickly either yes or no. Yet it demands study. There is that school of thought which insists that there should be public transportation in every community. Obviously this position will not stand analysis. There are plenty of communities throughout the country today that will not support public-carrier transportation unless you designate a few hacks or taxicabs by such a term. Certainly there are plenty of communities that cannot support a street railway system nor even a bus system, yet, unfortunately for the local transportation business, many of these communities do have public service transportation. It is in such communities that electric railways are in particularly bad financial shape.

Transportation companies in such communities are dying, of course. In fact, that is where the mortality is greatest. You have heard a great deal in recent years about dying electric railway companies. The fact is that they have died in about 60 communities in the United States, and the aver-

age company which has died has run just seven cars. There is no doubt that electric railway properties never should have been built in these communities, and when you hear that such an electric railway property has died it is no reflection on our industry in any way. It is a reflection on the judgment of the men who built the lines.

There is, however, in the larger communities a very great demand for public transportation, and this demand is going to increase. It is going to increase for both electric cars and buses.

NEED FOR RAILWAY INCREASING

The fact that no community in the United States of more than 50,000 persons now is being served solely by buses proves the necessity for the electric railway. As cities grow larger, populations become more dense and the mass transportation problem increases, the need for the electric car becomes more apparent. Increased traffic congestion, with its consequent lack of parking places, also is driving the private car owner back to the street car. These and many other causes, which are readily apparent in every community of any size, quickly show the need for common-carrier transportation service.

Recognition of this need for service is widespread, and coupled with this comes recognition of the second point I previously made, that a street car company must be given a chance to earn a profit the same as any other business. Most enlightened communities throughout the country long since have recognized the fact that a transportation company must be entitled to earn a profit the same as any other business or it will cease to function. In other words, if the street car horse is going to work, it must be fed. I want to make it very clear that this is not a poverty plea, or that it is intended to leave the impression that most communities are striving to starve their transportation companies to death. They are not. There has been a very decided movement on the part of local, state and national officials throughout the country in the last five years to play fair with the electric railways.

Fare increases have been granted very generally, and today the average fare throughout the United States is approximately 7.6 cents. In many communities the fare is 10 cents. An honest effort has been made in most communities to arrive at fair rates for car companies.

*Abstract of address presented before annual meeting of Midwest Electric Railway Association, Denver, Col., July 8-10, 1926.

Increased fares, however, have not always proved the best solution. Many operators are of the opinion that fares may easily be made too high. High fares often discourage riding. There are other means of assisting local transportation companies to prosperity. A dollar saved is a dollar earned, and if electric railway companies, particularly those which are badly overtaxed throughout the country, are given relief from paving and other taxes they may become more prosperous. Likewise, transportation companies can be aided materially toward prosperity by giving them clear rights of way so that they can make speed. A quick ride is an attractive ride, and the way to make it quick is to put into effect parking regulations which will cause the streets to be used as thoroughfares and not as storehouses.

It is impossible for me to lay down more than general rules for making electric railway companies prosperous. Of course, there are certain fundamentals, some of which I have mentioned, that will apply in every case, but also in every case there are local conditions which are of the greatest importance. The way to arrive at proper conclusions in these situations is to bring in the best minds of your respective communities, tell them the whole story and work out a plan of operation on a basis fair to all.

NEW YORK SITUATION EXPLAINED

You have seen much in the papers recently about the New York City local transportation situation. Since this affords a striking example of a city which has driven its transportation horse to exhaustion through failure to supply it with proper sustenance, I want to dwell just a little bit on this situation. A good deal of comment has been published about the possibility of New York City doing away with all of its trolley cars because they are a nuisance and cause traffic congestion. One proposed solution of this problem is to substitute buses for the trolley cars, and the most remarkable part about it is that this proposal to bring about traffic congestion relief would mean the substitution of five buses for every three street cars. It is probably the only case in the history of the world where it has been suggested that the way to make more space available is to occupy more of the available space.

In a nutshell the trouble in New York is that the 5-cent fare has failed. The surface lines have not failed. The 5-cent fare has not paid operating expenses. The rolling stock of the lines has gone down badly. Traffic congestion in the city is terrible. This also has hampered the surface line companies greatly in rendering service.

Despite these drawbacks, the surface lines of New York City today are carrying almost 40 per cent of all riders in the greater city. The subways, elevated lines and buses carry the remaining 60 per cent. Incidentally, the number carried by buses is a very small proportion. The biggest bus line in the entire city, the Fifth Avenue Coach Company, last year carried only 70,000,000 revenue passengers, whereas

the surface lines alone carried more than 1,000,000,000.

New York is one of the last large strongholds of the 5-cent fare. This political plank is a standard one for the controlling political party in the city of New York. No politician believes that he can be elected on any other platform. Therefore they all came out strongly for the 5-cent fare. The last administration was elected on this platform and so were preceding administrations. Now the administration is face to face with the fact that transportation is breaking down and that it cannot be built up under the 5-cent fare. Therefore it must find some way to give good transportation, because this is vital to the life of the city, but at the same time it hesitates to get away from the 5-cent fare plank.

Recently the situation came to a crisis when two things happened: First, a coach company obtained control of the New York Railways, which operates some electric car lines that are in very bad condition. The coach company then proposed to the city that it abandon some of the surface car lines the coach company controls, which have not paid for many years, and substitute buses thereon, chiefly at a 10-cent fare. The fare feature of this situation is a very important one for you to remember. The coach company proposed that it give a few short haul riders at a nickel, but most of its rides were to be 10 cents.

Simultaneously ex-Comptroller Craig came to the city with a proposal that it buy from him certain obsolete electric lines controlled by the New York Central Railway. He said that these lines were a nuisance and that the owners would relinquish their franchises if they were paid \$7,000,000.

Neither of these propositions, that by the coach company nor the one by ex-Comptroller Craig, has been accepted, but they have caused much uninformed comment about New York surface line conditions. If all the electric lines involved in the two propositions were abandoned not 5 per cent of the surface passenger traffic in the city would be affected. Yet the impression has gone out that these two minor proposals involve the greater part of the New York surface line systems. Nothing could be further from the truth.

Despite the unfortunate impression which has been created in many parts of the country that New York trolleys are to be abandoned generally, much good has come out of the proposal to substitute buses for trolley cars in New York City. City officials who a few months ago took at face value the promises of bus manufacturers to supplant electric car service with buses, give adequate service and relieve congestion have learned that such a promise cannot be performed. Therefore they are moving very slowly in the granting of bus franchises, and my prediction is that the ultimate solution of the New York City transit problem will be co-ordinated electric car and bus service, with the present transportation companies operating most of the buses. If this sort of arrangement is made fares will be kept at a minimum.

If it is not made, and independent bus companies are permitted to parallel existing transportation lines, citizens of New York are going to be faced with tremendously high local fares and no transfer privileges.

It is utterly ridiculous for any one to say that buses can supplant electric cars in the handling of mass transportation. Careful tests, made both here and abroad, prove conclusively that buses cannot handle traffic in rush-hour periods as expeditiously or conveniently as street cars. The relative ability of buses and street cars to carry passengers is shown by their past performances. During the last calendar year, operating under ideal conditions on Fifth Avenue, 385 buses carried an average of 196,000 passenger per bus annually. Operating throughout the city on branch lines and under all sorts of conditions, practically none of which were as good as those enjoyed by the buses on Fifth Avenue, 3,388 street cars, representing all surface cars in New York City, carried an annual average of 336,000 persons per car per year. In the Bronx all the street cars carried an average load of 415,000 per car. This included transfer passengers on both buses and street cars.

It will readily be seen from these figures that cars carried, in round numbers, between 70 and 100 per cent more passengers per vehicle than buses. In other words, it would require between five and six buses to replace every three street cars in New York City. Thus, instead of relieving traffic congestion, the substitution of the bus for the street car would simply add to it. Not only would you have five vehicles standing where three were before, but with the increase in number of vehicles the number of stops would also increase.

The assertion that buses would relieve traffic congestion by stopping at the curb does not apply on any street where there is parking. The utter impossibility of buses making stops at the curve on Seventh Avenue, Madison Avenue and similar congested New York thoroughfares is readily apparent. They would have to stop in the middle of the street. A standing bus will congest just as much traffic when standing parallel with the curb as a street car, and if it happens to stop crosswise on the street while attempting to weave in and out of traffic, it will stop much more than a street car.

STUDIES ON TRAFFIC CONGESTION

The United States Department of Commerce recently made a study of the causes of traffic congestion in the retail districts of various cities. Of all the cities reporting, the maximum congestion charged against the street car by any group was 3 per cent. The smallest percentage of traffic congestion charged against the street car was 4/10 of 1 per cent. The report points out that delays which are charged to street cars really should be charged against vehicles that are delaying the cars. "Just as the chain is no stronger than its weakest link, so traffic can move no faster on any one lane than the slowest moving vehicle, and that slowest moving vehicle may be any vehicle occupying the street car lane," it says.

The real test of the ability of the bus to supplant the street car in giving service would come during the peak traffic hours. Fifty per cent of all traffic handled in New York is moved during two hours in the morning and two hours in the evening. At that time also street congestion from other vehicles going to and from work is at its worst. It is one thing to carry sight-seers along Fifth Avenue in a leisurely way and quite another to deliver crowds going to work or to their homes during peak-hour traffic.

London's experience proves this. Over there when the buses reached a point where they could carry 40 per cent of all the traffic street congestion became so great that it was necessary to begin to remove buses. There were something like 6,000 buses operating in the heart of London and that was more than the streets could take care of. English transportation experts say that 5,000 more buses would be required to take care of the traffic if street cars were entirely done away with.

St. Louis has both street car and bus service. A recent survey showed that throughout the day 1,976 buses carried a total of 36,233 passengers, or eighteen a vehicle per trip, whereas during the same period 9,645 street cars carried 308,779 passengers, or 32 a vehicle per trip. During the rush hours street cars carried an average of 55 per cent

more passengers per vehicle than the double-deck buses.

Possibly I have seemed to dwell at length on the New York situation and I hope that you will not feel that I think, as the average New Yorker, that it is the only place in the world worth talking about. The reason that I have discussed it so fully is that I realize there is a misunderstanding of the situation outside of New York. Furthermore, it is an excellent example of a city which does need common-carrier transportation, and which has not permitted its companies to earn a fair return. If other cities want to know how to wreck their transportation systems and inconvenience their people I would suggest they make a careful study of New York's past transportation history.

The situation is not without hope, however. The crisis is at hand. New York, like every other big city, must have good transportation, and it is going to get it. The only way that it can get it is by paying a fair rate for it. New York is going to pay this price on street cars, buses and all other kinds of vehicles. Merely because some politician wants the fare to remain at a certain figure is no sign that it is going to remain there. The fundamental laws of economics make this impossible in New York as well as elsewhere. Rides must pay a profit or there will be no rides.

general overhauls were on the basis of 60,000 miles. This basis was found to be unsatisfactory. A great many road failures and pull-ins resulted, in spite of all we could do to prevent them. We found, after a careful investigation, that our motors were failing at less than 40,000 miles and that our wheel changes averaged 40,000 miles. Other important units were being changed at intervals less than our overhaul period.

OVERLOAD PERIOD INCREASED

In an attempt to synchronize our inspection and overhaul periods with the life of the various units on the cars, we bring our cars into the shop for truck overhaul every 40,000 miles. At that time we make a careful inspection, change wheels and correct many of the defects which would otherwise become the source of road failures and expensive carhouse changes in equipment. Our regular overhaul period has been increased from 60,000 to 80,000 car-miles. At that time the regular 40,000-mile truck overhaul is again carried out.

The following table gives a comparison of "Class A" pull-ins; that is, pull-ins resulting from mechanical failures:

	For Year	Average per Month
1924	9,203	767
1925	6,361	530
1926, five months....	2,129	426

Cars are inspected at the carhouses every 600 miles. At this time controllers are gone over and the brakes are adjusted. At 1,200-mile intervals there is a general inspection. This covers all bearings, lubrication, motors, controllers, wheels, brakes, etc., and at this time all minor replacements are made. Any major repairs or changes which have to be made at this time are expensive and every effort is made to prevent them by thorough work during shop overhauls.

In connection with the inspection of cars we have worked out a system of "General Orders" covering proper maintenance methods which must be observed. These orders incorporate what is accepted as good practice and tend to educate the workman and to eliminate any tendency on his part toward makeshift repairs. It is our intention to have the same job done exactly the same way each time.

We have in service approximately 2,800 motors, the greater portion of which may be termed "of old type or design," and due to this fact, together with the age of the equipment, it is necessary that we take every precaution to prevent failures. We have had very satisfactory results from the practice of swedging all armature coil leads into the commutator ears instead of soldering them. The swedging has almost entirely eliminated open circuits, which, with the former practice of soldering joints, were a common trouble.

In all motors taking sleeve type armature bearings wear between bearings and bearing housing is compensated for by copper-plating the outside of the bearing. It is possible to obtain a tight fit in an oversize housing in this way provided less than 0.035 in. of additional metal is required. The cost

Eternal Vigilance by Maintenance Men Needed to Meet Modern Conditions*

They Have a Large Part to Play Under Competitive Conditions—Service Failures Can Be Reduced to a Minimum Only by Scientific Study and Proper Teamwork

BY R. W. BAILEY
Superintendent of Power and Equipment
Kansas City Railways

THERE was a time in the electric railway industry, even with the 5-cent fare, when the low labor and material costs gave ample margin between income and operating costs. Consequently the man in charge of maintenance often did not measure up to present-day requirements. Present conditions are developing more equipment engineers and fewer master mechanics. Within the last few years more engineering research has been applied in this department of street railways than was ever conceived in preceding years. We have reached a point where advantage must be taken of every opportunity for reducing operating expenses without interfering with continuity of service.

At one time common-carrier local transportation agencies enjoyed the position of furnishing a service almost universally a necessity. This service has ceased to be a necessity to an increasing portion of the public, although it is still a utility to them. Due to the rapidly increasing use of the private automobile, it is becoming more important daily that operators consider the

likes and dislikes of car riders and provide an attractive, quiet and comfortable means of transportation. But that is not all. Cars must be moved regularly, safely and with maximum speed commensurate with safety. This means the elimination of equipment failures to cars in service. The public has become accustomed to fast individual transportation and the electric railway must do all in its power to compete with this type of transportation.

To maintain and operate our equipment at the lowest possible cost and at the same time provide satisfactory, salable transportation involves not only the replacement of defective units but, since very few of us are fortunate enough to operate modern equipment, it is necessary to add improvements and time-saving devices necessary to meet modern demands on our present equipment. The requirements for success under present conditions are managerial ability, intelligence and well-balanced engineering, including an accurate record of the performance of equipment. Last, but of greatest importance, is the need for eternal vigilance.

Our maintenance practices in Kansas City have been built up from this viewpoint. Previous to September, 1923,

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of copper-plating these bearings is much less than that of using an over-size bearing and boring the housing.

During 1923 we did considerable experimenting on armature bearing lubrication, particularly in reference to automatic oiling. It was found that 57 motors were being changed due to low bearings, and that upon investigation the bearings gave evidence of having been hot at some time previous to the actual failure. It was evident that we were getting bearing failures due to improper lubrication. These failures in a great number of cases resulted in a rewind job. During the early part of 1924 oilers were installed on all armature bearings of 57 and 67 motors. The result was better than we had expected. The performance of these motors, as far as bearings are concerned, is on a par with the other motors which we have in operation. In this connection it might be well to say that a further study was made of automatic lubrication as applied to axle bearings and that during 1925 oilers were installed on axle bearings on all 57 and 67 motors.

MOTOR BOLT PROBLEMS

One problem which has confronted the mechanical department of the Kansas City Railways has been the selection of the proper motor bolts for use particularly on the heavier types of motors on our older equipment. During the cold winter months we have had innumerable derailments, pull-ins and delays to service as a result of motor and gear case bolts breaking or the nut working off. We have used everything from a standard machine bolt to a high tensile strength alloy steel, heat-treated bolt. The performance of the different type bolts was carefully watched and finally our selection narrowed itself to the use of heat-treated axle steel bolts. After exhaustive tests and experiments we found that the majority of our bolt breakage was due to distortion in the structure at the bolt head where the head had been upset in its manufacture. This condition can be helped by annealing the bolt to relieve any strains set up during manufacture. It is, however, impossible to change the structure. Heat-treating also seems to be beneficial, but the results lack uniformity. In the manufacture of some bolts the bolt head is upset with a large fillet under the head which is afterward machined away. This leaves a good structure at the head. The best, though almost prohibitive as to price, is the straight-machined, heat-treated bolt. It is very good practice to leave a small fillet under the bolt head as a means of stopping small cracks or "cold shuts" on upset head bolts.

Our present specifications call for a heat-treated alloy steel bolt of very high tensile strength and which costs us approximately 25 per cent more than the average alloy steel bolt. The practice of annealing second-hand bolts and putting them back in service has been stopped, as the savings made by this practice do not justify the risk we take in putting them in service.

While we have not verified our selection of motor bolts by performance in

normal service over a period of time sufficient to prove conclusively that the problem is solved, our tests give us reason to believe that this type of failure will be much less in the future than it has been in the past.

In an attempt to improve axle bearing conditions on the property a great deal of experimental work has been done with die cast bearings. We are at the present time using die cast axle bearings for all replacements on General Electric 57 and 67 motors. The material used is as follows: Zinc, 80 per cent; copper, 4 per cent; tin, 6 per cent; aluminum, 10 per cent. The approximate cost of this material is 22 cents per pound, as compared with 25 to 30 cents for bronze.

Many advantages are obtained from their use in place of bronze bearings. Chief among these is a large saving in cost, which makes it practicable to replace bearings within much closer limits than usually are considered feasible with the much more expensive bronze bearings. Thus it is possible to keep motors fitted closely to the axles. This reduces considerably the wear and tear on equipment as well as the noise resulting from worn bearings.

The cost of a new die cast axle bearing is \$4, against \$8 for the bronze. But in the case of the die cast bearing, when it is necessary to scrap for wear, the cost is limited to the labor of casting a new bearing. The old material is melted down and a new bearing of any desired size can be made up on short notice. There is a substantial saving due to the elimination of machining labor.

In making die cast bearings cast iron molds are made and cores are used. A description of the apparatus and process was published in the issue of the *ELECTRIC RAILWAY JOURNAL* for Aug. 15, 1925, page 229.

While the bearing is being cast it is subjected to air pressure, which improves the density and wearing quality of the material. In the finished bearing windows, key-ways, oil grooves, etc., are cast so that the bearings are ready for use without machining or other finishing. For worn axles several sizes of center cores are used. Bearings are made to under-size bores in standard steps of $\frac{1}{16}$ in. The checks which we have made to determine wear on die cast bearings show less wear than on brass bearings. Breakage at the flange has been eliminated by casting a fillet back of the flange and shortening the height of the flange on die cast bearings.

Another method adopted to maintain gear centers is to match both die cast and bronze axle bearing to the axle; for instance, each time a pair of wheels is changed bearings are returned to the shop. The new pair of wheels going into service is installed together with the bearings which have been fitted to them.

TRACK MAINTENANCE MOST IMPORTANT

There is no part of the car where poor maintenance is so noticeable as in the trucks. The rattle and clamor of loose, worn or ill-fitted truck parts acclaim in loud tones their lack of attention. Even the properly maintained

truck of modern design is far from quiet, and it is only through eternal vigilance and frequent inspection that the older designs can be operated with any degree of quietness. When we consider the weight of the older designs of trucks and the unsprung weight which is being continually hammered over special work, crossovers and high rail joints and which is all too frequently being bounced along on a pair of flat wheels at the rate of two or three hundred jolts per minute we wonder that we can keep them in service 40,000 miles.

The most important part of truck upkeep is the tramming of truck frames at regular intervals. Due to collisions, split switches, excessive wear, etc., the truck frame is frequently cramped out of line. How many times have you seen a derailed car being put back on the rails by means of a log chain and a wreck car or truck hooked on to one corner of the truck frame. This is a fruitful source of sprung truck frames and, although sometimes necessary, results in untold grief for the truck maintenance man.

We believe in giving the truck a chance by starting with a square truck frame. We have found that it is possible to obtain much more rigid and sturdy construction by riveting and in some instances welding instead of bolting the frames. The application of case-hardened wear plates as a means of reducing localized wear and of soft iron wear plates as a means of absorbing wear where it can be compensated for easily and frequently are invaluable helps in maintaining tight, smoothly operating trucks.

Springs which are poorly matched or which have attained different degrees of set are a source of trouble. The majority of derailments on single-truck cars, especially of the safety type, are due to uneven spring tensions.

We have found it necessary to work over practically all our brake rigging. In this program a standard brake lever and pull-rod layout was made for each type of equipment with the idea of eliminating all off-set brake levers and pull-rods. At one time practically every pull-rod and lever replacement had to be bent on the job, since no standard was observed.

"MATERIAL SUPERVISOR" APPOINTED

Shortage of materials must be avoided if good maintenance is desired. If material is not available when needed, worn or defective parts are permitted to go into the car, which results in failures in service. Careful supervision and constant study of the supply and demand are necessary to insure against shortage. Nothing is more disheartening to the foreman responsible for a certain class of maintenance than a material shortage. It forces him to allow poor work to leave the shop or carhouse. We have created the position of "material supervisor," whose duty it is to see that the proper supply of material is fed into the "mill." He is responsible not only for material used in routine maintenance but is also in close touch with any special work which affects the material supply.

In connection with material we have found that it is usually cheaper to buy replacement parts instead of making them in our shop. The average street railway shop cannot compete with an industrial institution which operates on a production basis, and even if the cost is slightly higher, it pays to purchase most parts from the original manufacturer. When we begin to manufacture parts on a large scale, the actual maintenance supervision, which is our primary job, usually suffers. By buying from the manufacturer we take advantage of the engineering necessary to perfect the part. Frequently an apparently insignificant change may become later the source of a great deal of trouble.

Improvements in maintenance methods, changes in design of equipment and the installation of labor-saving devices are all secondary to the importance of good management. In management I include every member of the organization whose primary responsibility is supervision or planning of the work. It has been said that the foreman is the keystone in the arch of industry. He is the link between the management and the men, and because of this relation he is well worth every effort the management can extend to

help him improve himself, so that he may do justice to the important part he plays in industry.

The workman represents a part of every company's working capital. Stop and consider the interest you pay on this investment. If your payroll amounts to \$40,000 a month, then your workmen represent an \$8,000,000 investment. The return which you get on this investment varies directly with your ability to select the proper men, then to create in them an interest in their work, loyalty to their employer and the desire to co-operate in the production of better quality of work. Create in them the desire to do more than draw their pay envelopes. If your men are content, loyal and ambitious the \$8,000,000 investment becomes a real asset.

I do not believe in condemning a man too severely for an error in judgment. The man whose judgment "batting average" is more than 60 per cent is advancing and is a valuable man. He needs help in the way of encouragement and constructive criticism. He must be not only "with you" but "a part of you." As a part of our maintenance practice in Kansas City we have adopted the slogan "Eternally Vigilant."

Progress Being Made in Track Construction*

Interesting Experiments in Denver Look to the Development of Satisfactory Flexible Track—Advantages and Disadvantages of Rigid Track Analyzed—Proper Rail Sections for Use in Paving

BY NELSON R. LOVE

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SINCE the construction of the first horse car lines fundamental changes in track construction have been slow. In general the tracks have comparatively long lives, which in itself retards changes. Experiments are costly and the fruition of them very slow. The weight of rail used has been gradually increased. For many years special sections have been utilized primarily for greater convenience in maintaining a flangeway in paving.

Welding joints has developed rapidly in recent years, and the process is found to be almost an ideal application, as the forces due to temperature expansion and contraction are more or less continuously absorbed by the surrounding earth or paving, and the track is well constrained against "buckling." The use of steel ties and of concrete paving is rapidly becoming general and, as a result of this alone, electric railway track practice is rapidly departing from steam railroad practice and highly specialized designs are being developed.

Of all of the problems encountered in building electric railway track, that of constructing a satisfactory track through paved areas is the most baffling

and reveals the greatest variety of methods. Probably no method of building track in paving has been devised which is entirely satisfactory from every viewpoint.

The evils of electrolytic corrosion of the rail have been mitigated by bonding or welding joints, installation of copper negative return wires and the decentralization of substation capacity through the adoption of automatic substations in comparatively small units.

It can no longer be said that the life of the joint is the life of the track. The various methods of welding joints now available effectually eliminate joints, and at moderate expense.

Much progress has been accomplished in the improvement of special trackwork, particularly by the adoption of alloy steels for this purpose.

The mechanics of an electric railway track in operation are obscure, as direct observation is inherently impossible. Corrugation develops in the rails, and no one has offered an entirely satisfactory explanation or remedy for this phenomenon. The public is more and more demanding quiet operation of the cars. The rapidly increasing use of automobiles has brought a demand for more and more paving, both to eliminate dust and to make it easier for the

automobilist. Economy requires that whatever type of construction be used its first cost should be low and also its life should be long.

Much of the maintenance in city track is associated with the paving. Further than this every track repair also requires a pavement repair, so that electric railway engineers are making intensive efforts to improve the wearing qualities of paved track. Two schools have developed, one of these standing for the construction of massive rigid track, which will remain intact through its strength, the other standing for the construction of a comparatively lightweight resilient track, upon the ground that the very flexibility of the track protects it from injury.

An analysis of the conditions existing in a track while a car is passing over it would indicate that no matter how strong the track may be the forces developed will exceed this strength, even to the extent of causing permanent distortion of the metal in the surface of the rail, whereas if the track be flexible the forces are minimized, so that if construction can be made to provide for movement of the rail without any destructive action taking place the flexible track should outwear the rigid track.

DYNAMICS OF TRACK ANALYZED

Every moving body tends to move in a straight line, and if the force of gravitation be exactly equalized by spring tension it will do so. A street car must travel over slight inequalities in roadbed and rails, and is also subject to slight irregularities in the wheels. On account of the comparatively great weight combined with little room, the springs must be stiff. Added to this, a large percentage of the weight, wheels, axles, motors, truck frames, is nearly if not quite unsprung. When a car is traveling at high speed a considerable force is required to make it travel in other than a straight line.

Let us assume a wheel with an unsprung weight of 2,000 lb., and diameter of 30 in., traveling at a speed of 20 m.p.h. or 29 ft. per second. Assume further that an irregularity of 0.05 in. is encountered. If no distortion takes place, the wheel must be raised through a distance of 0.05 in. in 0.0035 second. The velocity in a vertical direction will reach 1.2 ft. per second, or approximately 0.82 m.p.h., and the acceleration will be 1.2 ft. per second divided by 0.0035 second, or 343 ft. p.s.p.s. This is approximately ten times gravity, and the force between the wheel and the obstruction will be 20,000 lb., or 10 tons; this with an unsprung weight on the wheel of 2,000 lb.

An obstruction of this magnitude is not uncommon in electric railway track, and even if the track were rigid enough to stand such forces, the metal would not. It is plain that if the rail could be depressed the 0.05 in. by a load of, say, 5,000 lb., then the impact would be not more than 5,000 lb., and probably a little less. This is only one-fourth of the impact on rigid track and requires only a very small resiliency for the reduction.

The above, while not exact, gives an idea of the magnitude of the impact

*Abstract of paper presented before annual meeting of Midwest Electric Railway Association, Denver, Col., July 8, 9, 10, 1926.

forces which may be developed in highly rigid track, and also the small amount of flexibility necessary to relieve these stresses. On account of the tendency of the moving car to proceed in a straight line, the flexible track is also a quieter, smoother riding track than the rigid track. The present tendency toward light-weight cars emphasizes the desirability of resilient track, as the lighter car requires a more flexible track to secure the same riding qualities as the heavy car.

In the foregoing illustration it will be noted that in the case of a resilient track, the track itself must be accelerated during the passage of the car over a bump, and due to its mass offers a resistance to this acceleration. In other words, the track may be resilient under static loads but apparently rigid, due to the mass of the rail, pavement and foundation, under moving loads. This dynamic rigidity is dependent not only on the mass per foot of the track structure but also upon the stiffness or section modulus. It is apparent that if a given deflection under a wheel extends for 5 ft. in front and in back of the wheel, the impact will be twice as much as if it extends only 2½ ft. front and back.

The mass of one running foot of track structure, paving, base and rail, 8 ft. 8½ in. wide and 18 in. deep, is approximately 2,500 lb., of which less than 100 lb. comprises rails. It is apparent that the dynamic rigidity of a track can be very materially reduced by separating the rail structure from the paving structure, at least in so far as vertical motion is concerned.

Thus, the impact stresses developed by a car in motion on a track are roughly proportional to the weight and speed of the car and the "dynamic rigidity" of the track; the latter in turn depends upon the rigidity of supports, the section modulus of the track and the weight of the track structure. Impact stresses may be materially reduced by lightening the car, increasing the flexibility of the track and separating paving from rail. Given common spring conditions the riding characteristic of the track is worse with light cars, but better with flexible track.

So far the practical side has not been touched upon. As an illustration of the truth of the above conclusions, think for a moment of open steam road track. Operation over such track, at speeds far in excess of the electric car speeds, is quieter and smoother than electric railway track. The ties and ballast are both highly resilient, and the amount of deflection is enormous when compared to electric railway track. The rail sections in use have much lower section moduli than do the rails used by many electric railways, and the mass of the track structure is only a fraction of that of the electric railway. In spite of the immensely greater wheel loads and higher speeds, the flowage of metal at open joints is less than on an electric railway with fairly tight joints. To watch a heavy train pass at a high speed over a crossing would make one wonder that it lasts until the train is over it, it moves so much; yet constrain the steel so that it cannot move and it will break.

In actual practice, a rigid track con-

struction presents several important advantages. Only steel and concrete are used. The construction is comparatively simple and easy and the materials required are few in variety. After the steel rail is worn out the steel ties and concrete foundation are available for use with new rail and paving surface, so that a large proportion of the first cost is permanent and suffers no depreciation. As there is no motion between rail and paving, no motion need be provided for.

On the other hand, corrugation seems to be peculiar to the more rigid types of tracks, and when it develops there seems to be no track structure strong enough to withstand the resulting vibration. The pavement separates from the rail, water gets in and frost action does the rest. Wear and tear on rolling stock is greater. If the corrugations are ground out, the rail is worn out at a far greater rate than by wheelage alone. Rigid track is invariably noisy track, and probably the noise and the corrugations both result from the same cause.

As a result of the monolithic type of construction repairs are usually difficult, as destruction of the entire paving surface is necessary. The quantities of material used are large and the rail is heavy, resulting in high cost. By very reason of its rigidity, the line and surface must be exact in order to secure reasonably smooth riding and prevent the generation of destructive stresses.

DIFFICULT TO JOIN PAVING ON FLEXIBLE TRACK

The initial stumbling block in the construction of flexible track is to secure a joint between rail and paving which will permit of movement of the rail relative to the paving, without any destructive action on the latter, but a joint which nevertheless will be watertight, to prevent the entrance of moisture and subsequent destructive action from frost. The invention within the past few years of an asphaltic rail filler, which occupies the space between rail and paving, may prove to be one means of overcoming this difficulty, but the preparation has not yet been in use for a sufficient length of time to determine whether or not any destructive action takes place in flexible track construction. Unless such a joint can be made, the construction of flexible track cannot be successful, at least in cities where freezing temperatures occur at certain seasons.

Another trouble lies in the difficulty of securing uniform resiliency. Unless special provision be made the ties supporting the rail will provide spots of greater rigidity, which are uniformly spaced. This circumstance will tend to produce poor riding qualities in the track and may lead to excessive corrugation, particularly at resonant speeds. Perishable materials are sometimes utilized in the construction of flexible track, in the effort to secure flexibility, and the life of the track is shortened to that of the perishable material.

Flexible track, if the difficulties mentioned can be satisfactorily overcome, presents several decided advantages. The tendency to corrugation is decidedly decreased, and the rail is therefore longer lived. The track and paving

structures are both considerably lighter than rigid construction, smaller quantities of material are required, so that such a type of track construction is considerably less expensive than a corresponding rigid construction.

For a number of years the standard for paved track construction in Denver has been what might be termed a semi-flexible type. This construction uses 65-lb. A.S.C.E. rail on 6-in. x 8-in. treated wood ties. The whole structure rests on from 6 in. to 9 in. pit run gravel ballast. The character of the climate and soil is such that further sub-surface drainage is unnecessary. Solid concrete paving to a depth of 9 in. is placed between the rails and to a distance of 15 in. outside of each rail. Within the last two years it has been found possible, by means of an electric vibrating apparatus, to improve the bond between the concrete and rail very materially. Results obtained with this type of track have been very satisfactory. About five years ago the wheels were changed from cast iron to steel wheels. At the same time the practice of maintaining proper coning of wheels was instituted. Coincident with this change, corrugation developed at a number of places where it had not existed before. Much of this corrugated rail has been ground and since that time corrugations have not reappeared except in a few isolated cases. Some of the older track shows a separation between the concrete paving and the steel rail. This has not developed at any location where the vibratory tamping was employed. The chief objections to this type of track are that it is somewhat noisy and in addition its life is limited by the life of the wood ties used in the construction.

FLEXIBLE TRACK WITH STEEL TIES

Within the past year further experiments have been conducted with the aim of securing a flexible track approaching as closely as possible the requirements for an ideal flexible track as previously set up, using steel ties, concrete and asphalt exclusively. In this construction the steel ties have been allowed to function only in a horizontal direction in order to maintain gage and proper tilting of the rail. Vertical load is sustained entirely upon ordinary paving asphalt mixed and solidly tamped underneath the rail and ties by means of electric tampers. This track has been in service for approximately one year. The rail does not come in contact with the concrete paving at any point whatever in the construction. The space between the rail is paved with concrete and the rail is kept separated from this paving by means of a special rail filler. The paving outside of the rail is the asphaltic street paving laid against the rail. A stretch was also tried with the rail filler between the rail and the street paving. The joint between the street paving and the rail is not yet satisfactory, as there is excessive deterioration of the street paving at some points. Further experimentation in this respect will soon be under way.

The steel ties were bent so that the rails were canted to a slope of 1 to 25. No sign of corrugation has developed in any of this track. This rail has worn

very smoothly. The track is decidedly quiet in operation and very smooth riding. The cost of this construction was approximately the same as for the standard type of track previously described—wood ties on ballast with 9-in. depth of concrete paving. The surface appearance of this type of track in the street is much more pleasing, primarily on account of the fact that the rails themselves constitute the only joints in the paving. The asphalt is continuous between the tracks from curb to rail, and the concrete is continuous in the track so that only four lines of separation appear in the paving. If the principles of the process prove satisfactory this type of construction can probably be installed at a lower cost than any other type now in use.

At this point it seems proper to mention a further result of this paving. No expansion joints were placed in the concrete, a continuous stretch approximately 1,200 ft. long. No large cracks whatever have developed and only a few hair cracks. In the older type of paving it was found that installation of expansion joints served no useful purpose, inasmuch as the concrete paving cracked without regard to the presence or absence of expansion joints. This was probably due to the fact that with welded joints the linear dimension of the steel rail could not change with the change of temperature. With cold weather the concrete contracted with a force greater than its tensile strength. The ties, and bond between the concrete and the rail, effectively held the concrete stationary at frequent intervals, so that frequent cracks would result. These cracks are easily treated by the use of primer paint followed by hot asphalt which effectively seals the cracks, but, nevertheless, results in unsightly appearance.

DESIGN OF RAIL WARRANTS STUDY

The rail used by electric railways has varied from the very lightest sections to some of the heaviest sections, with a strong tendency in the past few years, particularly among the advocates of rigid type of construction, to the heavier rails. The heavy rails are particularly well adapted to electric railway construction on account of the ease with which stone block toothing can be laid against the rail. It is, however, subject to the same disadvantages as the rigid track on account of a dynamic rigidity as previously explained, being introduced through the mass of the adjacent paving and of the rail itself, which must be accelerated when any motion in the rail takes place.

Special sections of rail have been developed for use by the electric railways better to accommodate paving and to provide flangeways. The special sections are particularly characterized by being extremely heavy and, further, having a high section modulus compared to the weight of the rail. In other words, the rail is very stiff, having excessive height of web and narrow flange. The extremely light rail is much less costly but has a limited life due primarily to corrosion of the flange and web. On account of the extreme lack of rigidity of the very light rails it becomes necessary to maintain the ties

or other supporting structure in good condition at all times or the rail is ruined on account of surface bending and breaking. The railway type of sections of comparatively light weight—65 lb. to 80 lb.—offer a rail which is sufficiently great in cross-section to withstand corrosion for a longer period of time than it takes the head to wear out. It is sufficiently flexible to permit of material reduction of impact. It is not as costly as the heavier sections.

In recent years the subject of canting of rail has been given considerable attention and there are some electric railway engineers who believe that this is the only thing necessary to prevent the formation of corrugation. This practice has in fact been found to be very effective in reducing corrugation. The reason back of this seems to be that if a properly coned wheel rolls on a vertical rail the area of contact between the wheel and the rail is extremely small as the contact takes place on a portion of the rail where the curvature is large. This results in high pressure per unit area, and the surface of the rail is easily subjected to a stress higher than its elastic limit with the result that cold rolling immediately takes place. If the rail be canted or tilted by means of canted tie plates, or if the rail section itself provides for the tilting on the upper surface of the rail, then the contact between the wheel and the rail takes place on a part of the rail of a much larger radius of curvature. As a result of this the effective area of contact becomes much larger with a small distortion of the rail surface so that the elastic limit of the steel is not reached.

Clambake Planned for New Englanders

PLANS for its annual outing on Thursday, July 22, have been announced by the New England Street Railway Club. This year it will be a sail on Casco Bay with an old-time clambake on Long Island.

The steam *Aucoscisco* has been chartered for the trip. It will leave Customs House Wharf, Portland, Me., at 10 a.m. A second trip will be made, leaving Portland at 12:30 p.m., arriving at Long Island in time for the clambake at 1 p.m.

Beginning at 11 a.m. there will be the usual program of sports for both men and women, followed by a baseball game between railway men and manufacturers. After the clambake there will be dancing.

Returning to Portland, the boat will leave Long Island at 4 p.m., reaching Customs House Wharf at 5:30, after a sail around the bay. The day's program will end with a light supper at the Falmouth Hotel.

Free transportation by bus from Boston will be provided, leaving North Station Wednesday, July 21, at 6 p.m. and arriving at Portland about 10:30 p.m. Returning the bus will leave the Falmouth Hotel 6:30 p.m., July 22. Those preferring can take the boat of the Eastern Steamship Line leaving Boston at 6 p.m. Wednesday and Portland 8:30 p.m. Thursday or the Boston & Maine train leaving North Station at 9 a.m. on Thursday and returning

from Portland at 7:10 p.m. Thursday.

All schedules are on Eastern daylight saving time.

Those desiring reservations for the trip or accommodations at the Falmouth Hotel should write George E. Haggas, Cumberland County Power & Light Company, Portland, Me.

American Association News

Way and Structures

HARD centers and switch tongues were the subjects of discussion at a meeting of the special way and structures committee No. 2 held on June 11 at the office of W. W. Wysor, chief engineer United Railways & Electric Company, Baltimore. Members present were C. A. Alden, R. B. Fisher, H. F. Heyl, G. A. Peabody, W. W. Wysor and E. M. T. Ryder, chairman. Messrs. Bragg and Davis of the United Railways & Electric Company attended as guests.

Discussion on hard centers was opened with the submission to the committee of several plans to show a comparison of the lengths of centers which are now being manufactured by large trackwork companies with those proposed by the committee. Several motions were then passed covering suggested changes in the plans which were made to produce an agreement with manufacturing practices.

At the last meeting of the committee assignments were made to the members for the preparation of sketches showing proposed devices for tongue switches. These sketches were submitted at this meeting for the purpose of criticism and discussion. A sketch of a new type of holding device will probably be prepared and presented at the next meeting of the committee.

In the afternoon Mr. Wysor and Mr. Davis took the committee on a tour of inspection through the Carroll Park Yards and the General Shops of the United Railway & Electric Company on Washington Boulevard.

Engineering Symbols

THE special committee on engineering symbols held its third and final meeting at association headquarters, New York City, on July 1. The meeting was attended by H. W. Coddington, chairman; J. D. Kent, C. W. Squier and G. C. Hecker.

Each of the members had completed his portion of the work of preparing the symbols, and the business of this meeting consisted of reviewing the finished portions of the report and preparing the sheets of symbols for submission to the association. The tentative report previously sent out to the members of the committee for comment and criticism was revised. This report includes 33 plates of symbols which have been agreed upon by the committee for submission as standards of the association.

The News of the Industry

Conference in Chicago

Mayor Seeks to Have Traction Officials Meet on July 22 to Discuss Terms of Proposed Franchise

Failure of officials of the Chicago elevated and surface lines to appear before the local transportation committee of the City Council after repeated invitations has evoked action from Mayor William E. Dever. Until now the Mayor has appeared only in the background, but he recently invited officials of both companies and bankers representing surface lines security holders to appear in his office on July 10 to discuss the proposed traction ordinance. Several of the company executives were absent from the city on that day, however, and the conference with the Mayor was postponed to July 22.

A proposal to bring about a referendum that would strip the Illinois Commerce Commission of its regulatory powers over all public utilities in Chicago, including traction lines, was introduced at the same time by Alderman J. M. Arvey. In order to put the question on the ballot at the next mayoralty election, the Alderman said, it will be necessary that a petition be signed by 25 per cent of the city's voters. The resolution calls for the appointment by the Mayor of a committee to prepare and circulate such a petition.

Another solution for the traction problem was presented to the Council in the form of a resolution calling for the appointment of a citizens' committee to iron out the differences between city and company officials. As conditions stand, there appears to be little prospect of an early agreement being reached.

A resolution introduced last month by Alderman Oscar F. Nelson and adopted by the City Council, which, if enacted as the result of appeal to the State Commerce Commission, would have compelled the surface lines to expend from its depreciation and renewal fund some \$5,000,000 for new cars and track extension, was withdrawn on July 13, when Corporation Counsel Busch told the Aldermen that the city did not have the right to enforce such expenditures. The fund is an integral part of the companies' properties that has been specifically appropriated for the renewal of parts, he said. Another opinion by Mr. Busch held that the State Commerce Commission is without authority to direct the surface lines to invest its damage claims reserve fund to obtain higher rates of interest than at present. A resolution to this effect had also been introduced by Alderman Nelson.

Alderman Nelson immediately announced that he would call upon the City Council to set aside \$100,000 from the city traction fund to conduct a city-wide survey for the purpose of ascer-

taining what will be necessary for the municipality to operate large fleets of motor buses to take the place of surface cars when the company's franchise expires next February.

Conciliation Board Begins Wage Hearing at Winnipeg

The board of conciliation appointed to investigate the dispute between the Winnipeg Electric Company, Winnipeg, Man., and the one big union unit of its street railway employees commenced its inquiry on July 13. Justice Lamont of Regina, Sask., is the chairman of the board; J. B. Coyne, K.C. is the company's representative on the board, and F. J. Dixon is the representative for the men. The dispute arose over the refusal of the company to recognize the one big union, which is an avowed communistic organization. The company is also resisting a demand for an increase in pay of 6 cents an hour which the one big union is making. The hearing will likely be a protracted one and the decision of the board is not expected for some time.

Legal Difficulties Delay Pittsburgh Subway

Although actual construction of the subway is not in prospect in Pittsburgh, Pa., study of the subject will proceed. Part of this study will consist of making surveys and drawings, for which Council recently approved the addition of seventeen new employees. Members of the transit department held a secret conference with the Council previously on the much discussed subway to relieve traffic congestion and to aid rapid transit. After the meeting it developed that there was little likelihood of a start being made on a subway before 1928. It was reported that the spokesman for the transit department discouraged starting on the underground street artery until legal provision was made to assess the expense of such an improvement against owners of all property benefited.

Traffic Survey at Cincinnati

In conformance with the request contained in a resolution adopted by the City Council the Rapid Transit Commission at Cincinnati, Ohio, has voted to use \$50,000 in bonds to defray the expense of a traffic survey to be made as a preliminary step in negotiating a lease of the transit system. In its formal action the commission adopted a resolution asking the City Council to allow the commission to issue \$50,000 for transit purposes. The bonds are available as the remaining portion of a \$150,000 allowance provided in the state law creating the Transit Commission.

Interborough Sues Strikers

Seeks \$239,000 Damages for Injuries to Its Business—Steady Improvement in Service

There were three outstanding developments during the past week in the partial strike which is in progress on the subway lines of the Interborough Rapid Transit Company, New York. First, the strikers failed to get out any considerable number of the transportation men on the Manhattan elevated division, or in the power houses, or any material addition to the number now striking on the subway division. Second, there was a continual improvement during the week in service given on the subway division, as evidenced by the increasing number of trains run and passengers carried. Third, suit was brought by the Interborough Rapid Transit Company on July 13 in the Supreme Court of the State of New York against 62 ex-employees, named in the summons and complaint, for \$239,000 damages already sustained and plea for injunction before other damages and loss are inflicted.

The complaint points out that the company operates approximately 130 miles of elevated railroad and 244 miles of subway with 9,000 trains daily which carry 3,500,000 passengers; that it has about 14,000 employees who, under an association known as the Brotherhood of Rapid Transit Company Employees, treat with the company on the question of wages and working conditions; that through this brotherhood a contract covering these matters was entered into between the brotherhood and the company on June 30; that all employees of the company have agreed to be members of this brotherhood and not of any other employee organization, but despite this fact the defendants are unlawfully persuading or attempting to persuade large numbers of employees of the plaintiff to refuse to continue in its employ at the wages agreed upon and to break their contract of employment, are holding meetings, using threatening language, circulating false reports about the company and making unreasonable demands upon it for increased wages, all of which is an unlawful combination and conspiracy to injure the company's business.

The injuries so far inflicted are said to be upward of \$239,000, for which the company asks damages, as well as an injunction to prevent further damage. It asks particularly that the defendants be restrained from persuading present employees to absent themselves from their duties, from making demands on the company for increased wages, from circulating letters or other communications among the employees of the company urging them to join any union other than the brotherhood, from doing

any acts knowingly and wilfully to get the employees or any of them to break their contracts with the company, from picketing or loitering on or in the neighborhood of the company's cars, stations, structures or other premises for the purpose of persuading the company's employees to desist from the performance of their duties, from injuring any of the property of the company, etc. With the summons and complaint, the Interborough Rapid Transit Company submitted a copy of the con-

stitution and by-laws of the brotherhood, correspondence between some of the strikers and the company and other exhibits.

The legal basis for a suit of this kind is discussed editorially in this issue of this paper.

On Thursday, July 15, service on the subway division was more than 60 per cent normal even in rush hours. At no time during the strike has there been any material decrease of trains operated on the elevated division.

New South Shore Equipment in Service

Brief Review of Progress Made on the Program for Rehabilitating Road Operated Through Steel District of Indiana—More Than \$3,000,000 Spent So Far for Reconstruction

COMPLETION of the first unit in the rehabilitation program of the Chicago, South Shore & South Bend Railroad was announced on July 13 when the new steel passenger equipment was placed in service between Michigan City and South Bend, Ind., the eastern terminus of the road. Extension of the use of the new equipment over the entire line from South Bend to Chicago will be made later in the month.

Use of the new motor passenger cars was begun on the eve of the first anniversary of the acquisition of the railroad by the Midland Utilities Company and the operation of the line by Samuel Insull and associates. The railroad was formerly operated by the Chicago, Lake Shore & South Bend and the property was purchased by the Chicago, South Shore & South Bend Railroad at public auction on June 29, 1925.

Actual operation of the railroad as a subsidiary of the Midland Utilities Company began on July 15, 1925. Since that time an extensive program of rehabilitation has been carried on and a total of \$3,618,250 has been invested in improvements. Of this amount \$2,761,250 has been spent by the railroad, including \$1,330,000 for new equipment, \$1,428,250 for changing of the entire electrical overhead, new rail, new ties, improvement of passenger stations, freight houses and other expenses. An "ideal" section of double track right-of-way, 1 mile in length, has just been completed near Miller, Ind. Three-wire catenary trolley construction replaces the old center-pole trolley suspension. In addition \$857,000 has been invested by the Northern Indiana Public Service Company for eight new electric substations and high-tension lines, from which the railroad will be supplied with power under the new direct-current operation. Five of the substations will have a capacity of 1,500 kw. and the remainder 750 kw. Four of them will be equipped with mercury arc rectifiers, a type said never before to have been used by an electric railway in the United States.

The motor passenger cars which were tested in the yards at Michigan City and placed in service last week on the east end of the railroad are part of an order of 25 new cars which are being built by the Pullman Car & Manufacturing Corporation. More than half of these cars have been received and the others will be delivered within the next few days. Three of the four new

electric freight locomotives have been delivered and these also were placed in service on July 13, hauling freight trains between South Bend and Michigan City. Two dining cars and two parlor-observation cars are likewise being built by the Pullman Company, but these will not be delivered until later in the summer.

The new cars have deep-cushioned mohair velvet seats, dome ceiling lights, three electric fans in each car, deeper car springs and separate smoking compartments for each car. Several of the cars will have the regular Pullman car type smoking rooms, with an aisle around the side. This is an unusual type of car for use on an electrically operated railroad.

The next few weeks trains will stop in Michigan City and trailers will be transferred from the old section to the new, with the beginning of operation of the steel cars. This is necessary because the new equipment is operated with direct current and the old cars with alternating current.

The growing popularity of the Sand Dunes country at the foot of Lake Michigan and the increasing traffic to points in this territory have made it necessary for the company to add several new trains and new stops to the summer schedule. Special low rates are now in force from Chicago and other stations.

Fare Case in Omaha Not to Be Reopened

The State Railway Commission has refused to reopen the fare case of the Omaha & Council Bluffs Street Railway, Omaha, Neb. The proceedings covered the rates fixed for Omaha only. They were placed at 10 cents cash with six tickets for 40 cents. City Commissioner Butler, leader of the opposition to an increase, asked for a rehearing on the ground that the company, when the rate case was pending, contended that the bridge connecting the two cities and owned by it was no part of the system and that its cost, revenues and profits should not be considered in determining a proper rate of fare, but that the company revised its stand when it protested to Congress against a bill to permit a free bridge across the river at Omaha. When advised by the commission that if the revenues of the bridge are to be considered with respect to rates now when it is making money,

whatever deficit might arise in the future from its operation would then have to be borne by the car riders, Mr. Butler was content to let the matter drop.

Cincinnati Wages to Be Arbitrated

By a vote of 758 to 345, members of the Amalgamated Association turned down the proposal for a graduated increase in the pay of motormen and conductors, as well as other employees, as submitted by the Cincinnati Street Railway, Cincinnati, Ohio. The question now goes to arbitration. The employees sought an increase of 12 cents an hour, but the proposal of the railway offered them a contract for two years with an increase of 1 cent an hour every six months for a period of two years. The motormen and conductors are now getting 53 cents an hour and the operators of the buses run by the company 57 cents an hour. The proposition of the company for an increase of 4 cents an hour covering a two-year period also applied to the bus drivers. The arbitration of the problem will be conducted by three men, one from each of the respective factions, and a third chosen by the two representatives.

Strike in Indianapolis on Wane

Members of the citizens' committee, seeking to aid in the settlement of the Indianapolis strike, met on the afternoon of July 15 with officials of the Indianapolis Street Railway. The conference lasted almost the entire afternoon, but it failed to bring about any definite results. The committee said it was interested only in restoring service and in seeing that fair play was received all around.

Members of the committee were informed by officials of the company that service had been restored. It was pointed out that the company was now fewer than 25 men short of the 40 per cent who quit work more than a week ago. In reference to the method of settling disputes between company and men, officials of the company cited the committee a contract with the men, approved both by Judge Anderson, when he was on the federal bench there, and by Judge Baltzell, present federal judge, in which it is specified that disputes be taken up first with the superintendent of the company. If no satisfactory settlement can be made, then the matter is referred to the president of the company, and in event of failure of settlement the men have recourse to the Indiana Public Service Commission. Officials of the company pointed out that in the present instance the men listened to the advice of organizers and "kicked over the traces," leaving the company entirely unprotected. Officials of the company signified they would not discharge men hired recently and take back strikers.

Officials of the company report that during the peak load hours morning and evening little difficulty is being experienced in handling the crowds. Most merchants report business good and the downtown shoppers show no lack of buying power. As for the general public, it appears to be indifferent.

Relief from Paving Asked— Passengers Off in Seattle

Demand that the Seattle Municipal Railway be relieved of paving or planking between car tracks and that the cost be assessed against the abutting property was voiced at a recent meeting of the utilities committee of the City Council by D. W. Henderson, superintendent of railways.

A petition from a West Seattle Improvement Club for repaving with planks between car tracks on California Avenue caused Councilman Ralph D. Nichols to declare that the "time has arrived when these communities which are asking the municipal system to spend its money in improving the streets in their districts should be given to understand that they must support the street cars."

Mr. Henderson declared that privately owned traction lines all over the country are being relieved of the burden of paying for paving.

According to William Pitt Trimble, chairman of the rapid transit committee of the City Planning Commission, average daily passenger traffic over the municipal traction lines has decreased steadily during the first six months of 1926 over the figure for the corresponding period of last year.

The Trimble committee submitted figures to show that 47,094,051 passengers were carried on the municipal lines in the first six months of 1924; 46,113,640 in the corresponding period of 1925, and 45,050,004 in the first six months of 1926, a loss averaging about 1,000,000 passengers during each succeeding six-month period.

P.R.T. Band Wins Cup at Festival

The Co-operative Welfare Band of the Philadelphia Rapid Transit Company, Philadelphia, Pa., won first place in the band competition held on June 24, in connection with the musical festival at the Municipal Stadium. The 110-piece band was declared the winner in the senior band event in competition with thirteen other bands. In the drum and trumpet corps event the company also won first place in a field of six. The first prizes awarded to the Philadelphia Rapid Transit Company are two silver loving cups, the formal presentation of which will be made at the company's picnic on Aug. 31.

Curbed Parkway for St. Louis Railway Cars

The Board of Public Service of St. Louis, Mo., on June 25 approved the plan for a curbed parkway for street cars in the center of Olive Street when that thoroughfare is widened between Twelfth Boulevard and Channing Avenue. The board acted on the recommendation of Director of Streets and Sewers Brooks, who submitted an extensive statement outlining the advantages of the plan for segregation of street car and other vehicular traffic on the street, which is the city's chief east and west highway.

Under the plan approved by the board

when Olive Street is widened from 60 ft. to 100 ft. there will be a 23-ft. neutral zone in the center for street cars, with two 26½-ft. roadways for other vehicles and 12-ft. sidewalks for pedestrians. He said it would speed up street car traffic and reduce considerably the danger of accidents.

Safety islands will be installed for street car riders and stops will be made only every three blocks from Grand Boulevard to the down-town district. The Olive Street cars, which now average 9 m.p.h., can increase their speed safely to 15 m.p.h.

Conference on Segregation Issue Called at Albany

Chairman William A. Prendergast of the Public Service Commission has called a conference for July 20 at the office of the commission in Albany in the matter of the petition of the United Traction Company for increased fare in Albany, Troy, Rensselaer, Cohoes and other communities. The conference will be for the purpose of hearing arguments on the applications of the interested communities that for the purpose of the present rate proceedings the property of the company be segregated.

Wage Arbitration in East St. Louis Closed

Testimony was closed on July 9 before the board of arbitration named to decide whether the motormen and conductors of the East St. Louis & Suburban Railway, East St. Louis, Ill., are entitled to increased wages. The men desire an increase of 10 cents an hour approximately from the present scale. The arbitration board is composed of C. E. Smith and B. F. Thomas, St. Louis engineers, representing the company; W. L. Perry and J. R. McMurdo, representing the men, and Frank M. Slater, St. Louis attorney, as chairman. Decision in the case has been reserved.

Amortization Versus Improvements in Buffalo

Commissioner Frank C. Perkins of the department of public affairs in the Buffalo, N. Y., City Council has asked the city law department for an opinion on the legality of a sinking fund of \$2,940,990 set aside by the International Railway in 1925 for amortization of intangible capital, especially in view of the fact that Bernard J. Yungbluth, president of the railway, says the company is without funds to make improvements to its tracks as ordered by the Public Service Commission. Commissioner Perkins in his appeal to the city law department recommended that the Public Service Commission direct the company to keep its property in safe operating condition. The International Railway is questioning the authority of the Public Service Commission, which recently ordered it to make repairs to its tracks. Mitten Management, Inc., which operates the Buffalo traction system, is taking the matter before the courts.

Knights Templar Parade Handled Well in Springfield

Many compliments have been received by the management of the Springfield Street Railway, Springfield, Mass., on the successful manner in which it handled the crowds gathered there June 24 for the Knights Templar parade, in which some 10,000 persons were in line. This was the biggest undertaking of its kind ever tackled by the company of that city.

Two distinct problems were involved in handling the crowds. One was to keep the regular traffic moving throughout the entire system with the exception of portions of Main and Dwight Streets and certain side streets, where traffic was suspended for two hours and fifteen minutes. The operations involved the transport of thousands into the business district to witness the spectacle. The other problem was to provide prompt and efficient service at the point where the marchers broke ranks to board special cars for the Eastern States Exposition grounds in West Springfield. There were 70 of these specials, and by a plan carefully worked out in advance 40 of these cars left the carhouse at 11:20 o'clock, or 40 minutes ahead of the time the parade was due to start, and the rest at 12:15, just after the procession had got under way.

Many cars not chartered were run as extras for the accommodation of those who did not go over in the main body and also for returning crowds. General traffic on the system was handled by turning cars back over their regular lines from points near the line of march, leaving the parade route clear for the occasion. The police gave efficient co-operation.

Toledo Ordinance Issue to Be Rushed

Speed in the preparation of an ordinance embodying changes in the Milner franchise governing the operations of the Community Traction Company, Toledo, Ohio, is being demanded by Mayor Fred J. Mery. The document may be ready to submit to City Council at its meeting on July 26. The Mayor has assurance from Law Director Frank M. Dotson that he will devote his entire time in the interval to work on the franchise ordinance. If an early agreement is reached there is a possibility that the matter may be submitted to voters at the regular November elections.

Henry L. Doherty, representing the holding company owning most of the Community Traction Company securities, has informed the Mayor that he will favor a plan worked out along the suggestions of Prof. H. E. Riggs, who made the transit survey last summer.

A recent questionnaire of the Chamber of Commerce shows that many business leaders are anxious to arrive at an early solution of the transit problem. This indicates that the modifications of the present plan to obtain better railway and bus service co-ordinated under one management will probably have plenty of support from the business interests.

Rapid Transit and North Shore Trainmen Denied Wage Increase

The demands of approximately 4,500 trainmen of the Chicago Rapid Transit Company for a wage increase of 5 cents an hour and other concessions were rejected on July 12 at a conference between union leaders and officials of the company. Instead, a counter-proposal of a decrease of 5 cents an hour and no overtime until after a ten-hour day was brought forward by the company.

If the company should grant the increases asked—and it is without funds to do so—\$700,000 would be added to its annual payroll, B. J. Fallon, vice-president, told the workers' committee. The employees are seeking restoration of the 1922 peak scale, which was reduced by 10 cents in 1923. Since that date they have regained 5 cents an hour. At the present time motormen are receiving 77 cents an hour, conductors 72 cents and guards 70 cents. The wage agreement expired on June 1.

The company's reply will be submitted to the union officials at once. Arbitration will probably follow. Both sides say there is no immediate prospect of a recurrence of the five-day strike in August, 1922.

Trainmen of the Chicago Surface Lines, who are endeavoring to obtain similar wage increases, are expected to be strongly influenced by the outcome of the negotiations between the elevated men and their employers.

In referring to the short life of the present franchises, Guy O. Richardson, vice-president of the Surface Lines, announced on July 13 to representatives of the 5,000 shopmen employed by the company that their demands for an average increase of \$1 a day after the union contracts expire next month could not be granted.

Trainmen of the Chicago, North Shore & Milwaukee Railroad have also demanded that their wages be increased from 76 cents to 82 cents an hour. The company, on the other hand, proposes a reduction to 73 cents an hour and the shortening of the present nine-hour working day to eight hours.

Discussion of New York State Fare Continued

The hearing on the petition of the New York State Railways to charge a 10-cent cash fare or three tickets for 25 cents on its Oneida-Kenwood line has been closed before the Public Service Commission. According to evidence submitted by the company there have been operating deficits for the past three years ranging from \$8,065 in 1923 to \$28,836 in 1925.

Based on the proposed increase in cash and ticket fare, the company's witness figured an increase in revenue of \$13,359 in 1926, due to the increased fare, if allowed. This estimate is based on a 2 per cent decrease in the riding and 20 per cent of the riders paying a cash fare and 80 per cent buying tickets.

The hearing before the commission on the petition of the New York State Railways to charge a 10-cent fare with three tickets for 25 cents in the city of Rome was postponed until July 27 to give the city an opportunity to examine

the exhibits and the evidence submitted.

The company claimed operating deficits of \$10,632 in 1920, \$23,967 in 1921, \$13,431 in 1922, \$4,235 in 1923, \$10,498 in 1924 and \$6,914 in 1925 under the present 7-cent fare.

Based on the revenue passengers carried in 1925 and the proposed increase, if granted, the company estimated an increased revenue of \$19,069 in 1926.

Wage Increase Asked by Cincinnati Men

An increase in pay of 12 cents an hour is requested by members of the Amalgamated Association, who are endeavoring to negotiate a new contract with the Cincinnati Street Railway, Cincinnati, Ohio. The present wage agreement, made two years ago, expired on June 30. Motormen and conductors now are paid 53 cents an hour. In view of the fact that no new agreement has been reached, it is likely that the question will go to arbitration. The new demands call for 60 cents an hour for the first three months, 63 cents for the next nine months and 65 cents thereafter. Shopmen, greasers, power houses and car-house employees also are asking for increases.

Analysis of Causes of Delays in Milwaukee

Congestion of streets is the outstanding and predominating cause of interruptions and delays in electric railway service, according to a compilation made by the Railroad Commission of Wisconsin.

Of the total of 8,886 causes of delay in one month in Milwaukee, 5,370 are attributed to interference with the movement of cars occasioned by street congestion.

A table listing the causes of delay follows:

Causes	Number	Per Cent of Total
1. Street congestion	5370	80.5
2. Operating conditions	840	9.5
3. Rolling stock	628	7.2
4. Electric distribution	456	5.1
5. Accidents	307	3.5
6. Weather conditions	267	3.0
7. Steam railroad crossings	221	2.5
8. City equipment	195	2.2
9. Bridges	159	1.8
10. Trainmen	133	1.5
11. Way and structures	88	1.0
Cause not given	212	2.4

The items included in the above column of "causes" are in general as follows:

1. Street congestion—This consists of delays due to street traffic, both vehicular and pedestrian, interfering with the movement of the cars; cars held by other cars ahead; regulation of traffic by officers or light signals; and accidents not involving street cars.

2. Operating conditions—This consists of time required to load passengers; heavy loading; waiting for passengers transferring from other cars or those not ready to board; failure of passengers to step away from the loading door after paying fare; slowness of passengers in paying fare; lapse of time after passengers are loaded before conductor signals motorman to proceed; lapse of time after receipt of signal before car starts.

3. Rolling stock—Car trouble and car changes.

4. Electric distribution—Power off; low voltage; wire down; phones and signals in bad order.

5. Accidents—Those accidents involving street cars, such as derailments.

6. Weather conditions—Rain; snow; sleet; fog; bad rail; snow sweepers.

7. Steam railroad crossings—Delays caused by trains or crossing gates held down for trains.

8. City equipment—Fires; fire apparatus; patrol wagon; ambulance.

9. Bridges—Opening at such times as to delay cars.

10. Trainmen—Due to use of students, pulling out late; late relieving; calls of nature; tending stoves; getting sand; late from previous trip.

11. Way and structures—Trackwork; switch trouble; utility cars; temporary track.

News Notes

900 Turns a Day Saved.—The Board of Public Utilities has sanctioned the rerouting of a number of lines of the Los Angeles Railway that will materially affect the entire system. Approximately 900 car turns a day will be eliminated from the congested district. In addition, considerable mileage is saved.

Receiver of Company Honored.—Col. Albert T. Perkins, general manager for Receiver Rolla Wells of the United Railways, St. Louis, Mo., has been named chairman of the committee on military and naval affairs of the Greater St. Louis Exposition to be given by the St. Louis Chamber of Commerce in Forest Park next September. With the co-operation of the War Department assured by Secretary of War Dwight Davis, Colonel Perkins and his committee have made tentative plans to present the greatest military tournament every arranged in conjunction with a non-military affair.

Fewer Stops to Expedite Travel.—The City Council of Macon, Ga., recently approved an agreement entered into by a committee of Council and the Macon Railway & Light Company to eliminate a number of railway stops on the system. This was done with a view to speeding up traffic and reducing dangers from automobile accidents. The move is in line with the police committee's efforts to improve traffic conditions throughout the city generally.

Through Service Between Washington and Annapolis.—The Washington, Baltimore & Annapolis Electric Railroad, with headquarters in Baltimore, Md., has started a through service between Washington and Annapolis, eliminating the necessity of changing cars. Trains leave West Street station, Annapolis, at 6.50 and 7.20 a.m. daily, except Sundays, and leave Twelfth Street and New York Avenue, Washington, at 4 and 5 p.m. daily, except Saturdays and Sundays.

Parades Banned.—In accordance with an order of City Manager Sherrill of Cincinnati, Ohio, street parades are banned in the congested districts of Cincinnati except for those of a strictly civic nature. The order will eliminate all organization parades, whether religious, political or fraternal. In the opinion of the Police Department this regulation has become necessary because of the tremendous congestion and the interference with business that accompanies such parades.

Recent Bus Developments

Legislative Study of Bus Question in Massachusetts

Massachusetts has settled the status of its bus business for the present. In other words, things will probably go on as they are for another year. The law covering common carriers, however, as it stands and as it operates today is not wholly satisfactory. The faults in it are to be studied and recommendations made to the next Legislature.

All the individuals and corporations undertaking to provide coach services in the state have had hearings before the various public tribunals and have obtained their licenses, permits and certificates and they are now operating under a law which has been tested in court and upheld in several court decisions, and they are following rules and regulations carefully prepared and adopted by the Department of Public Utilities. By this long process they have qualified as legalized carriers.

There are today 116 such individuals and corporations owning bus certificates in Massachusetts, and they operate over about 250 definitely established routes, for which they hold licenses from the city and town authorities.

The process for all of them was to secure a license from the city or town authorities, a permit from the highway division of the State Department of Public Works to use the streets, and finally a certificate of public convenience and necessity from the Department of Public Utilities, to whose officially promulgated rules and regulations they must conform in the matter of equipment and service.

In issuing certificates of public convenience and necessity to these 116 firms and individuals the Department of Public Utilities has sought to protect existing transportation lines against needless and ruinous competition. Routes have been approved and business rights have been defined in each individual license with due regard for the effect upon the other transportation service in the community, in so far as the public tribunals have been free to act. There are a few cases where the Department of Public Utilities probably would not issue any certificates on the basis of the present merits of the situation, but the concerns were operating a year before the new law went into effect and that gave them *prima facie* evidence of public convenience and necessity and the required certificate could not be denied. In cases where motor coach certificates have been issued to the railroads and to electric railways the Department of Public Utilities has sought to co-ordinate the service, so that bus service meets the train schedules, and it has ordered the maintenance of through fares, making bus tickets valid on trains.

In cases where electric railway and the bus lines were operating on somewhat the same schedule in the same territory, the bus perhaps starting just

a little before the trolley and sniping the passengers, the Department of Public Utilities has ordered a spread in the schedules so that the half-hour service of one of the agencies would supplement the half-hour service of the other. In one instance where a corporation was operating on an early license issued to an individual, as was the case between Orient Heights and Revere Beach, the department required the filing of a new petition.

Highway Commissioner's Ruling Hits Columbia Jitneys

Samuel McGowan, chief highway commissioner of South Carolina, has issued a memorandum to the superintendent of motor transportation to the effect that new applicants for class "C" licenses, to which belong the 10-cent jitneys, file with the highway department a liability bond in the sum of \$250 and that all certificates revoked by failure to file bond on June 17 will remain revoked for the rest of this year. It is stated that only fourteen of the 143 jitneys now operating in Columbia and its suburbs abided by the requirement to file bond on June 17, so approximately 130 are outlawed.

This order, it is believed, will serve to simplify greatly the transportation problem in Columbia. Heretofore the 10-cent jitneys have been operating over the city, offering a sharp competition to both the bus lines and the railway system. They were for the most part under no bond and passengers rode in them at their own risk, yet because they carried passengers at the same rate as street cars and buses and carried them direct to their doors jitneys have been heavily patronized. The buses now operate on practically all of the principal streets and issue transfers to the three street car lines which are still operating, all other street car lines having been discontinued because of falling revenue.

It is said that the jitney union has engaged the services of an attorney to oppose the order of the highway commissioner on the ground that the commissioner has no authority to bond cars operating within the city limits of Columbia.

The buses operated by the Carolina Transit Company are bonded to the extent of \$11,000 each, according to state highway department officials.

The manager of the Carolina Transit Corporation, Chester Hawkins, is quoted as having said that unless something were done to prevent the 10-cent jitneys from picking up passengers he would have to abandon operations. Action of this kind on the part of the bus company would leave Columbia, the capital of the state, without transportation facilities. The street cars were allowed to discontinue operations on all but three lines when they reported steady losses because of the failure of the people to ride the trolleys.

Buses Proposed for Lincoln

The Lincoln Traction Company, Lincoln, Neb. has the backing of the City Council in an application made to the State Railway Commission for authority to abandon certain suburban trackage and substitute bus service. The buses will operate from the business center to the state penitentiary and state hospital for the insane to the south and southwest at the same fare, 10 cents cash and four tickets for 30 cents, with transfers, as charged on the street car. This is the beginning of a development of bus service co-ordinated with railway service for the city.

At the hearing C. N. Chubb, one of the officers of the United Light & Power Company, which owns the traction company, told the commission that his company's experience had convinced him that railways in cities of less than 100,000 population were doomed unless a profitable method of combined bus and car service were worked out and unless the companies were relieved of paying for paving between the rails and adjacent to them, together with occupation taxes. Decision was reserved.

Application Before Commission for Bus Rights in Hornell

A hearing was held before the Public Service Commission on June 24 on the application of Raymond E. Page to operate bus lines in the city of Hornell and to the village of Canisteo, Steuben County. Service would also be offered to the village of North Hornell. At the present time transportation service in this territory is furnished by the Hornell Traction Company. Proof presented at the hearing showed that the trolley lines would be discontinued July 15, when the property of the traction company is to be sold under mortgage foreclosure. It appears that the company has defaulted in payment of its bonds and further operation of the railroad has become unprofitable. Consent to the operation of the new bus lines has been granted by the Common Council at Hornell.

Mr. Page, the bus applicant, was formerly receiver of the Hornell Traction Company. He has been identified with that property for some time.

Temporary Order Against Bus Permits in Omaha

The City Council of Omaha, Neb., has been temporarily restrained from issuing permits to bus lines to carry passengers within the city limits in competition with the Omaha & Council Bluffs Street Railway. The plaintiff in this case was the Guarantee Trust Company, New York City, representing the bondholders. That company raised the question of an exclusive franchise as the principal bar. The State Supreme Court recently freed the hands of the Council, tied by previous injunctions obtained by the railway on the ground that the permits the Council proposed to issue were legally franchises and that a vote of the people was necessary. The Supreme Court held that the grants did not partake of the irrevocable nature of franchises.

Financial and Corporate

Separation of Alton Properties Effected

Four new companies have been formed by the North American Company to take over and operate various parts of the properties of the Alton, Granite & St. Louis Traction Company and the Alton Gas & Electric Company, recently purchased at foreclosure sale by representatives of the North American Company for \$1,965,000. The North American Company owned all of the common stock and about 90 per cent of the bonds of the two companies prior to the sale, which was ordered by the federal court at Danville. The new companies, formed so that the various properties could be split up into unified and compact businesses, are the St. Louis & Alton Railway, which will operate the interurban lines between St. Louis, Mo., and Alton, Ill.; the Alton Railway, which takes over the city lines in Alton, Ill.; the Alton Gas Company and the Alton Light & Power Company. George K. Miltenberger has been named president of each company.

The arrangement of having the interurban and city electric railways, gas system and electric light and power services together under one management, with all of them hampered in financial and other operations by the laws designed to govern any one of them, proved awkward, uneconomical and inconvenient. This opinion was expressed by Louis H. Egan, president of the Union Electric Light & Power Company of St. Louis, representative of the North American Company in that district.

The bonds of the Alton, Granite & St. Louis Traction Company had paid no interest from 1920 and on Aug. 6 of that year a petition for a receiver was filed with the United States District Court. On Aug. 11, 1920, receivers were appointed. The Alton Gas & Electric Company went into receivership on Dec. 31, 1925.

Baltimore Easements Must Be Valued

The Maryland Court of Appeals recently handed down an opinion in the valuation case of the United Railways & Electric Company, Baltimore, Md., under which the Maryland Public Service Commission will have to hold a new hearing in the case for the purpose of placing a value on the easements. The case was taken to the Court of Appeals by Clarence W. Miles, formerly people's counsel, who sought to have stricken out the \$7,000,000 allowed by the commission for easements and upheld by the lower courts. The total valuation on the property as fixed by the commission was \$77,000,000, including the \$7,000,000 for easements.

The Court of Appeals neither affirmed nor reversed the decision of the commission or the lower court, but the action pleased the officials of the United. The

highest court of the state took the stand that the company should be allowed a valuation for easements, but this should not be allowed as easements but as interest in real estate.

In a statement issued by the United following the action of the court it was stated that the company naturally was gratified that the opinion upheld its contention that easements were property, like any other property, and the company was entitled to include them in its valuation. The company also stated it contemplated no increase in fare, "preferring to work things out on the present fare as long as possible."

The commission does not expect to conduct the rehearing until the fall.

\$1,060,000 South Shore Equipment Trust Issue Offered

Equipment trust gold certificates, Series A, of the Chicago, South Shore & South Bend Railroad, South Bend, Ind., to the amount of \$1,060,000 are being offered for subscription by Halsey, Stuart & Company, New York. They are dated July 1, 1926, and are due serially over a period of ten years. They are in the denomination of \$1,000 except those due July 1, 1931, and 1936, which are in the denomination of \$1,000, \$500 and \$100. So significant is the offering, regarded from the standpoint of those interested in obligations of this kind, that the maturities and prices quoted by the bankers have been reproduced in the accompanying table.

The certificates will be issued by the trustee and will represent about 80 per cent of the actual cost of new equipment, consisting of ten three-compartment baggage, smoker and passenger motor cars, fifteen two-compartment smoker and passenger motor cars, four 80-ton electric locomotives, two dining cars and two parlor observation cars.

In the opinion of counsel, upon the delivery of the equipment to the railroad full title to the equipment will be vested in the trustee for the benefit of the certificate holder. The lease will be assigned to the trustee and will provide for rentals to pay the certificates and dividend warrants as they come due. Under the terms of the lease the railroad will covenant to maintain and keep the equipment in good order and repair, to replace any of said equipment that may be worn out, lost or destroyed, and to insure the equipment against loss or damage by fire to an amount of not less than the bal-

ance of the certificates unpaid and outstanding.

The Chicago, South Shore & South Bend Railroad owns and operates the high-speed electric railroad, 69 miles in length, extending from South Bend, Ind., westward to the Indiana-Illinois state line. The outstanding common stock is owned or controlled by the Midland Utilities Company.

Sales of W., B & A. Bonds Attract Attention

Bonds of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., 5 per cent issue of 1941, were dealt in heavily again on July 13 on the Baltimore Exchange, one block of \$50,000 changing hands. Total transactions amounted to \$105,000, all at 64½ to 64¾.

This quotation has ruled for several days, despite the fact that sales during the last few days have amounted to more than \$250,000, face value. Practically all the bonds offered have been bought by one house.

The liquidation is said to have been for account of interests compelled to dispose of their holdings. Despite the large amounts of the issue coming on the market the liquidation has failed to break the price under 64½. This has caused more or less comment and has resulted in a revival of the stories of a closer affiliation of local utility interests with the affairs of the company.

Short Hudson Valley Line Abandoned

The Hudson Valley Railway, Glens Falls, N. Y., has abandoned its Geysers, Belt and Kaydeross lines as well as the Mechanicsville-Ballston line, 13.67 miles long. Permission for the abandonment was given by the Public Service Commission. The evidence showed that the revenue from these lines had been steadily decreasing since 1922, and that the operation had resulted in a deficit since 1923. In connection with this abandonment trouble arose with the United Transportation Company (the Albany-Pittsfield Bus Company), which received a certificate under which it operated from Troy to Mechanicsville and Saratoga. After the abandonment by the Hudson Valley this company started operating from the city line of Mechanicsville to Saratoga Springs. The railway obtained an injunction restraining the United Transportation Company from operating in Mechanicsville in competition with it. The matter has been argued before Supreme Court Justice Christopher J. Heffernan, who has reserved decision. Another incident in this case occurred on July 6, when the Public Service Commission

MATURITIES AND PRICES OF CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD

(Accumulated dividend to be added in each case)

Amount	Annual Dividend	Maturity	Price	Yield	Amount	Annual Dividend	Maturity	Price	Yield
\$106,000	4½%	July 1, 1927	99.76	4½%	\$106,000	5½%	July 1, 1932	100.00	5½%
106,000	4½%	July 1, 1928	99.06	5%	106,000	5½%	July 1, 1933	98.58	5½%
106,000	5%	July 1, 1929	99.66	5½%	106,000	5½%	July 1, 1934	98.42	5½%
106,000	5%	July 1, 1930	99.11	5½%	106,000	5½%	July 1, 1935	98.26	5½%
106,000	5%	July 1, 1931	98.37	5½%	106,000	5½%	July 1, 1936	98.12	5½%

held that granting certificates for the operation of bus lines by Peter Palmer between Mechanicsville and Saratoga Springs and by Anthony Verno, Anthony and Michael Zappone between Mechanicsville and Saratoga Springs, by way of Ballston, did not appear to be a public necessity in view of the service which is now being afforded by established service.

Balance in Porto Rico \$103,432

The net income of the Porto Rico Railways, which controls the Porto Rico Railway, Light & Power Company, San Juan, P. R., for the year ended Dec. 31, 1926, amounted to \$371,710, after providing for depreciation. Income derived from other sources, \$12,250, made the total net income \$383,961. This fact was contained in the report of the directors at the nineteenth annual meeting of the shareholders. After many appropriations

CONSOLIDATED STATEMENT OF PROFIT AND LOSS OF THE PORTO RICO RAILWAYS, LTD.

(For year ended Dec. 31, 1925)

Net profit from operation for year after providing for depreciation.....	\$371,710
Add: Net income from other sources.....	12,250
	<hr/> \$383,961
Less: Interest on bonds—	
First mortgage bonds.....	\$113,045
Refunding mortgage bonds...	64,483
	<hr/> \$177,529
Office site reserve.....	25,000
Income tax reserve.....	8,000
	<hr/> 210,529
Deduct: Dividend on preferred stock.....	\$173,432
	<hr/> 70,000
	<hr/> \$103,432
Add: Balance at credit Dec. 31, 1924.....	691,494
	<hr/> \$794,926
Combined surplus carried forward.....	<hr/> \$794,926

STATISTICAL STATEMENT OF THE PORTO RICO RAILWAYS, LTD.

	1925	1924	1923	1922
Expenses per cent of earnings..	64.83	60.54	67.27	61.15
Passengers carried....	2,611,748	3,935,713	5,103,186	6,069,237
Passenger car-miles.	891,708	1,092,260	1,164,838	1,183,693
Passenger earnings per car-mile..	14.47	17.96	21.92	26.68

had been made, including interest on mortgage bonds, office site reserve and income tax, there remained a profit of \$173,432, out of which has been paid \$70,000 dividend on the preferred stock for the year. The balance of \$103,432 has been added to surplus account, which was carried forward at \$794,926.

The accompanying statement shows the consolidated account of profit and loss for the year ended Dec. 31, 1925, with some statistical data for 1925 and the three preceding years.

Interstate Company Gets Attleboro Branch Railroad

The Interstate Street Railway has bought the franchise and property of the Attleboro Branch Railroad, Attleboro, Mass., and the transaction has been approved by the Massachusetts Department of Public Utilities. The

financing that is involved has the department's approval in the following order:

Ordered, that the commissioners of the Department of Public Utilities hereby approve as reasonable and proper and for a lawful purpose the issue by the Interstate Street Railway, in conformity with all the requirements of law relating thereto, of bonds to an amount not exceeding the par value of \$150,000, said bonds to be dated April 1, 1926, and to be payable April 1, 1951, to be known as 6 per cent sinking fund gold bonds and to bear interest at the rate of 6 per cent per annum, and to be equally secured by a first mortgage upon all of the company's franchise and property, such bonds or the proceeds thereof to be used solely for the payment and cancellation of \$50,000 car trust notes of the company now outstanding and \$100,000 in payment for the property and franchises of the Attleboro Branch Railroad and for no other purpose.

The Interstate company, the purchasing company, operates an electric railway in Plainville, Seekonk, North Attleboro and Attleboro.

Rumors and More Rumors of Impending Deals

Charles S. Hand, writing in the *New York American*, says the Brooklyn-Manhattan Transit Corporation in the last year or so has purchased 100,000 of the Interborough's 350,000 shares of stock and that Thomas L. Chadbourne, dominant figure in the B.-M. T., is credited with holding 60,000 shares, while the remaining 40,000 are in the name of Gerhard M. Dahl, chairman of the B.-M. T., and his lieutenants. He says that William F. Kenny, business associate of the Bradys and intimate friend of Governor Smith, is reported to have control of the Third Avenue Railway. According to Mr. Hand, a new traction merger is in prospect welding subway and important surface lines into a unified system. Similar stories, not quite so definite, have appeared in other papers, notably one in the *Brooklyn Standard Union*.

In commenting on the latest rumor, J. L. Quackenbush, for the Interborough, said:

I do not know whether Gerhard M. Dahl and Thomas L. Chadbourne and their associates have purchased 100,000 shares of Interborough Rapid Transit stock.

The last time I looked at the stock list of the Interborough the names of Dahl and Chadbourne did not appear, but of course their holdings could be obscured under the names of brokers.

The company is keeping the fare question out of this strike. We have not asked for an increased fare since a year ago last March, when we presented a memorial to the Legislature. The fare question may be taken up in connection with the \$22,000,000 platform extension program.

Seeks to Abandon Six-Mile Line.—The Northern Ohio Power & Light Company, Akron, Ohio, is seeking abandonment of its East Greenville line, operating out of Massillon. This line covers a distance of approximately 6 miles.

Steam Line Negotiating for Electric Railway.—Representatives of the Missouri Pacific are negotiating for the purchase of the Murphysboro & Southern Illinois Electric Railway, which operates between Murphysboro and Carbondale, Ill.

Short Abandonment Rights Sought.—The Utah Light & Traction Company, Salt Lake City, Utah, applied for permission to abandon a part of its Third East Street line. The company also

desired to remove the tracks. It is urged that economy in operation of the traction system requires this change.

Line No Longer Necessary.—The Buffalo & Erie Railway petitioned the Public Service Commission on July 9 for authority to abandon that portion of its line in Lackawanna, N. Y., on Ridge Road between South Park Avenue and Abbott Road. The company alleges that this part of its line has been operated at great loss and is no longer necessary for successful operation of the road or for the convenience of the public.

Permission to Sell Is Sought.—Authority to abandon and sell as salvage the property of the Lebanon-Thortown Traction Company, Lebanon, Ind., was requested in a petition filed July 6 by the company before the Public Service Commission of Indiana. It set out that the line, 10 miles in length, is losing money, that it owes large sums for electric current and other bills it is unable to pay and that it cannot keep the road in repair. Permission is requested to sell the road at the best salvage prices obtainable.

Increase in Net Income.—The net income of the United Railways & Electric Company, Baltimore, Md., was \$104,861 during May, 1926, an increase of \$26,636 over the corresponding month of last year. The total revenue was \$1,464,456, or an increase of \$30,734 over May, 1925. Revenue passengers, exclusive of transfer passengers, numbered 19,778,990, an increase of 346,345 over the number carried in May, 1925.

Earnings of Connecticut Roads Decline.—Earnings of electric railways in Connecticut in 1925 were \$14,726,915, showing a decrease from the \$15,586,454 reported a year ago. The net tax to be paid is \$435,838. The business of the Connecticut Company forms the major part of these figures, the gross earnings for the year being \$13,794,645 and the amount of tax \$408,155. Earnings of other companies and the tax assessed against each follow: Bristol & Plainville Electric, \$189,514, tax, \$5,574; Danbury & Bethel, \$132,983, tax, \$3,821; Groton & Stonington, \$138,623, tax, \$4,158; Hartford & Springfield, \$155,222, tax, \$4,551; New Haven & Shore Line, \$106,686, tax, \$3,200; Thompson Line of "New Haven" road \$5,817, tax, \$174; New York & Stamford, \$147,270, tax, \$1,684.

Line Formerly Under Lease Is Sold.—Sale of the street car tracks on College Avenue north of 46th Street to Broad Ripple and east on 63d Street to Broad Ripple Park, formerly owned by the Indiana Union Traction Company, to the Indianapolis Street Railway, Indianapolis, Ind., is announced. The price, \$85,477, has been approved in the Madison Circuit Court. This stretch of track has been under lease to the Indianapolis Street Railway since the spring of 1924, when city service to Broad Ripple was instituted. The extension of service was made at that time, when, under an order of the Public Service Commission, a 7-cent fare was established to Broad Ripple with the understanding that the Indianapolis Street Railway would take the line over.

Personal Items

M. T. Montgomery Joins J. G. Brill

Twenty-eight years of operating experience in the electric railway industry may be credited to M. T. Montgomery, who has just become affiliated with the J. G. Brill Company, Philadelphia, Pa. His career to date has been a most interesting one. Beginning as a motorman in his home town, Pittsburgh, he has been intimately associated with actual operating practice in this country, in Mexico and in Cuba. Of course, with the advancing years came responsibilities on an ever-ascending scale, new problems, widened horizons. Among the positions held were those of traffic manager, division superintendent, freight agent, manager of railways. Now, with this background of transportation and mechanical experience, he steps into another phase of the industry.

Mr. Montgomery will handle sales in the southeastern territory, including Virginia, North Carolina, South Carolina, Georgia and Florida, for the Brill company. He will be actively concerned only with the electric railway sales of that concern. The wide experience gained during his years as an operating man will doubtless prove invaluable in the work which he now undertakes. Mr. Montgomery will make his headquarters at the Brill plant in Philadelphia.

A. W. Robertson Heads Philadelphia Company

Successor Named to A. W. Thompson with Utilities at Pittsburgh—Thirteen Years an Officer of Companies There

Ex-Judge James H. Reed, senior vice-president of the Philadelphia Company, announced on July 14 the election of A. W. Robertson as president of the Philadelphia Company and affiliated corporations, effective Sept. 1. He will succeed A. W. Thompson, appointed to the United Gas Improvement Company.

Mr. Robertson is well qualified, both by training and experience, to head the utility companies serving Pittsburgh and vicinity. A resident of Pittsburgh for twenty years, he has been in close touch with the development of the greater Pittsburgh district. His experience as an executive of the Philadelphia Company dates back to 1913. As vice-president in charge of public relations he has been in touch with nearly all operations and in direct charge of the general service department, which maintains all relations with domestic customers of the company, the adjustment or claims department, the advertising department, and relations with the public service commission.

Andrew Wells Robertson was born in Panama, N. Y., in 1880. He attended Allegheny College at Meadville, Pa., was graduated in 1906 and entered the law

school of the University of Pittsburgh in that year. He was graduated with the degree of LL.B. in 1910 and was admitted to the bar. After several years of general law practice he became attorney for the Pittsburgh Railways and the Duquesne Light Company. This was in 1913. In 1918 he was made general attorney for the Philadelphia Company and affiliated corporations, and in 1923 was elected vice-president in charge of public relations, retaining also his position as general attorney.

Mr. Robertson is a member of the Pittsburgh Chamber of Commerce, Pennsylvania State Chamber of Commerce and the following clubs: Civic Club of Allegheny County, South Hills Country Club, University Club, Duquesne Club, Phi Delta Theta Fraternity.

In referring to the resignation of Mr.



A. W. Robertson

Thompson and the election of Mr. Robertson, John J. O'Brien, president of the Standard Gas & Electric Company, said:

It is a matter of keen regret to lose Mr. Thompson as president of the Philadelphia Company. Mr. Thompson holds a high place in the affections and regard of the people of Pittsburgh, as well as the executives and employees of the Philadelphia Company, and we wish him great success in his new work. We are glad that there is within the organization a man so capable as is Mr. Robertson, whom we can promote to the presidency with the full knowledge that he possesses all the qualifications necessary to fill this important position satisfactorily. Mr. Robertson is thoroughly familiar with the institutions and ideals which have made Pittsburgh the great industrial and cultural center that it is. His experience as vice-president in charge of public relations has brought him in close contact with the public, and I feel that he is an excellent choice for the presidency of the Philadelphia Company. He and his associates can depend on the complete co-operation of our entire organization.

Charles D. Hardin, Seymour, Ind., general agent of the railway department of the Interstate Public Service Company, Indianapolis, Ind., will assume charge of the traffic department of the company as acting traffic manager. In this capacity he succeeds to the duties previously performed by the late Bert Weedon.

C. J. Norstrand Promoted

Long Island Electric Lines Under
Supervision of Experienced
Transportation Exponent

The new general manager of the Jamaica Central Railways, Inc., which has taken over the lines and operation of the Long Island Electric Railway, New York, N. Y., is C. J. Norstrand. His principal experience in the transportation field was gained from his connections with steam roads, where he filled various positions as accountant, statistician, auditor, claim agent and comptroller. Electric railroading also contributed to his fund of knowledge during the time he served as comptroller for the three Long Island Electric railway lines, which were under Gen. Lincoln C. Andrews as receiver. He held this position for two years, ending March, 1926.

Mr. Norstrand's activities, however, have not been confined to the transportation field. He has devoted his energies to banking concerns, army corps and shipping ventures and has more than once cast his lot with Uncle Sam. Such was his colorful career when in 1908 he entered the service of the Union Pacific at Omaha, Neb., in the traffic department. After advancing through various positions with this company he resigned in January, 1913, to become assistant statistician and later chief statistician and general accountant with the El Paso & Southwestern Railway, El Paso, Tex. In November, 1915, he became affiliated with the Chicago Great Western Railroad as valuation accountant. During the next few years he served in the United States Marine Corps. However, some force must have been directing his footsteps back into the transportation business, for in 1920 he went back to the steam railroad field, lining up first with the Erie Railroad and later with the Pittsburgh, Shawmut & Northern Railroad. Early in 1924 he assumed the duties of comptroller of the Long Island Electric lines under General Andrews.

Since taking over the operation of the Long Island Electric, now known as the Jamaica Central, he has made traffic surveys and is regulating the present service to meet the increasing demand. He has found that much of the equipment now operated is too heavy and large for most economical service and his plans for future equipment are based upon the modern conception of efficient operation with small units at short headways. As the funds of the new organization would not permit buying new cars, he has leased some and bought ten others, which he hopes will tide the line over until the railway is in position to provide new cars.

His staff of officers includes men taken from General Andrews' organization in connection with the three lines under him as receiver. William Ross is superintendent of maintenance and was formerly engineer of maintenance of way for the lines under General Andrews. Harry Weissmann is superintendent of transportation and was formerly a dispatcher for the Long Island lines. Thomas J. Lawson is auditor, William A. Methone is claim agent and served in this capacity for

twenty years with the New York & Long Island Traction Company. The officers of the corporation are H. Pushae Williams, president; Park A. Rowley, treasurer, and C. J. Norstrand, secretary.

Mr. Norstrand was born in 1883. He was educated in private schools and the Gymnase and the University of Christiania, Norway, and was graduated in 1903 with the degree of B. A. In 1904 he entered the service of the Bergen Credit Bank in its foreign department and later spent two months in banking houses in London, Paris and Amsterdam. Early in 1904 he took a position with a shipping concern and a short time later he enlisted in the U. S. Marine Corps and was honorably discharged in 1908 with rank of sergeant.

Messrs. Chilton and Sargis Advanced in Syracuse

Appointment of W. H. Chilton, division superintendent, and M. J. Sargis, supervisor of schedules, as assistant superintendents of transportation of the New York State Railways, Syracuse lines, has been announced by E. K. Miles, superintendent, effective at once. The appointments are part of a reorganization of the operating departments made necessary by the death of John E. Duffy, veteran general superintendent.

Mr. Sargis began his service with the company as a clerk in 1906 and Mr. Chilton as a conductor in 1905. Under the new plan Mr. Sargis will continue in charge of schedules and Mr. Chilton will supervise the employment and other divisions, with Mr. Miles in general charge of all operations of the Syracuse lines.

C. H. Robinson Leaves Bloomington

Charles H. Robinson, master mechanic of the Bloomington & Normal railway lines of the Illinois Power & Light Corporation, has resigned, effective July 15, to engage in personal enterprises in the Pacific Northwest. Mr. Robinson entered the shops of the company in 1898 and was gradually advanced to chief electrician and master mechanic. He had charge of maintenance of the Park Street power house and at the time of the consolidation of the Bloomington Electric Light Company and the Bloomington & Normal Railway, he was advanced to supervise all its electrical units.

Personnel Changes in Sandusky

Three changes in personnel have been announced by the Lake Shore Electric Railway, Sandusky, Ohio.

O. H. LaZelle, Salem, freight agent of the Youngstown & Ohio Railway, succeeds J. F. Starkey, who resigned as traffic manager of the Lake Shore Electric Railway. W. A. McNeal, Dayton, superintendent of overhead lines on the Cincinnati & Dayton Traction Company, succeeds George H. Moore, Jr., Fremont, as superintendent of the overhead lines. Albert Brownworth, superintendent of carhouse and shops at Sandusky, succeeds Frederick Heckler, Fremont,

as superintendent of motive power and of cars at Fremont.

Mr. Starkey has been in the service of the Lake Shore Electric for fifteen years, and until three years ago served as general passenger agent. At that time freight over the electric line became an important feature and he was promoted to the position of traffic manager.

F. N. Robinson Leaves New York Commission

Frank N. Robinson, assistant secretary of the Transit Commission, New York, N. Y., has tendered his resignation, effective August 1. He will accept a position as publicity director of the National Council of Boy Scouts of America. Few newspaper men in New York are better known than is "Robbie." Few newspaper men were or are better informed than he on transit. His term of service in the employ of the news-gathering agencies in New York City and on New York City newspapers covered a period which totals more than fifteen years.

Regulation came into being in 1907 in New York, and no sooner had it been ushered in than Robinson, then in the employ of the City News Association, was assigned to cover the workings of the new body. Effectively to do this he made his headquarters with "Jim" Walker, then assistant secretary but now secretary of the commission. All during the days of the negotiation of the so-called dual subway contracts, which gave New York its present system of rapid transit lines, Robinson was one of the chief avenues through which the newspaper reading public of New York was kept informed about what was going on.

Not only that but the idea of commission regulation was new. New York had subways before the dual contracts were negotiated, but it had little or no regulation, so New York, and the rest of the country for that matter, were concerned with the precedents that were being made. Robinson wrote about transit and the doings of the commission, wrote about them understandingly and interestingly. For eight years he did this. Then in 1916, when Mr. Walker was made secretary of the commission, "Robbie" was made assistant secretary, a public relations as well as a newspaper post and one that included among its duties the preparation of the proceedings of the commission for publication. There he has been ever since, surviving each successive political change. He has resigned now only because his new work is national in scope and affords a wider field for his activities than does the work with the commission.

So "Robbie's" service with the commission as an employee covers a period of ten years, while his career on newspapers covers a period of about sixteen years. Other than his work for the City News Service, "Robbie" served the New York Mail on City Hall and transit matters. "Robbie's" counsel and help on transit matters and political trends will be missed by a myriad of newspaper men and by his immediate associates, to whom he had endeared himself over a long period of years.

Obituary

G. L. Fowler

George L. Fowler, consulting mechanical engineer, editor and writer on literary and scientific subjects and a member of the American Society of Mechanical Engineers and the American Electric Railway Association, died on July 2. He was one of the early editors of the ELECTRIC RAILWAY JOURNAL, then known as the STREET RAILWAY JOURNAL, but for the past 30 years he had been a consulting engineer, specializing in handling railway mechanical problems.

Most of this work had been for steam railroads. It included research in the field of locomotive design, construction and operation, investigations regarding the qualities of steels used in steel tires and solid steel wheels, the stresses in car wheels, the lateral stresses imposed on track by loaded cars and locomotives while in service, etc. His work along these lines had many practical and tangible results.

Mr. Fowler gave considerable attention also for various clients to electric railway problems. Here the fields of his research work included studies in rolling resistances, the gyroscopic action of the motors on electric locomotives, and rail corrugation. On the latter subject he conducted a series of tests for the ELECTRIC RAILWAY JOURNAL about twenty years ago, the results being published later in this paper. Mr. Fowler was for many years contributing editor to the *Railway Age*, and was the compiler and editor of the 1906 and 1909 locomotive dictionaries issued by the publishers of that periodical.

He was born at Cherry Valley, N. Y., in 1855 and was graduated from Amherst College.

Andrew Nance

Andrew Nance, at one time manager of the Belfast Street Tramways, died on June 22. During his managership, from 1881 to 1905, at which latter date the Belfast tramways were acquired by the Belfast municipality, the operation of the system was marked with much success. Mr. Nance was continued in the managerial position by the City Council, and the electrification of the tramways was carried out under his supervision.

On his retirement from the post of general manager of the Belfast tramways in 1916 Mr. Nance was appointed consulting engineer to the City Council. By his death the United Kingdom has lost one of the most forceful and enterprising personalities in the tramway field.

Valentine Hechler, 87 years old, a pioneer in the building of the first electric railway of Richmond and one of the first in the country, and also in the building of the Richmond-Seven Pines interurban electric railway, is dead. For a long time he had not been active in business, but he preserved many of his contacts of former years. He was born in Richmond on March 10, 1839.

Charles A. Coffin

Founder of General Electric Company Dies at His Long Island Home—Had Been a Potent Factor in Electrical Manufacturing Industry for Forty Years

CHARLES ALBERT COFFIN, president of the General Electric Company from its organization until 1913 and chairman of its board from then until his retirement in May, 1922, died on Wednesday night, July 14, after an illness of a week, at his home at Locust Valley, Long Island, N. Y. He was 81 years old.

ENCOURAGED SCIENTIFIC STUDY AND INVENTION

It is probably no exaggeration to say that during his long connection with the General Electric Company Mr. Coffin did more to create and stabilize the electrical industry than any other man or group of men. His encouragement of invention along useful lines, his financial talents, his tireless energy and his courage in introducing new apparatus made his work supreme in the field to which he devoted his life. His energy and executive talent were part and parcel of the whole electrical advance and found an opening in the development of the steam turbo-generator, hydro-electric machinery, propulsion of ships, street railway transportation and the electrification of steam railroads and finally in the progress of radio communication.

The development of the electric light and power industry was influenced to no small extent by his remarkable foresight and leadership. Without any special scientific or technical training, but with an intuition almost uncanny, his recognition of men of great scientific attainment and of purely scientific research and the part they play in industrial development is singularly illustrated by the research laboratory at Schenectady, the establishment of which was made possible by him. On one of the few occasions at which he was induced to speak for publication Mr. Coffin said that he had early recognized that research laboratories, manned by great scientists, could not be restricted to commercial purposes. It had been the laboratories' job to discover all that could be discovered about electricity, and the company had had to "apply those discoveries to human need, to broadcast the knowledge, to translate the discovered truths into concrete service."

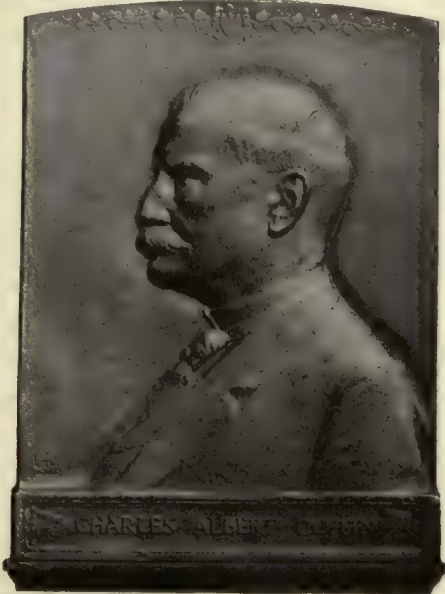
He was among the first to recognize the desirability of bringing the use of electrical energy to every household and every workshop, and a large part of his career had been devoted to the development and financing of electric transportation companies and local electric light and power companies and to the establishment of the vast power systems of the present time.

A MANY-SIDED MAN

He was a many-sided man. He had the highest possible conception of the duties of citizenship. He had the keenest appreciation of the arts, of literature and of nature. As one of his associates said of him, "Mr. Coffin's char-

acteristics were so catholic in character that his right hand hardly knows what his left hand does."

In May, 1924, he was made an honorary member of the Franklin Institute of Philadelphia. On this occasion Samuel Insull, president of the Commonwealth Edison Company of Chicago, introduced Mr. Coffin as a man whose "vision, courage and constructive ability" had signally contributed "to the upbuilding of the great electrical and other industries," but who was "modest beyond ordinary conception, desirous



of giving credit at all times to others and claiming none whatever for himself, with a loveliness of character which endears him to his friends."

FOUNDATION NAMED FOR HIM

After his retirement from active work for the General Electric Company the directors, calling him "the founder and creator of the General Electric Company, of which he has been the inspiration and leader for 30 years," established the Charles A. Coffin Foundation "as an expression of appreciation of Mr. Coffin's great work not only for the General Electric Company, but also for the entire electrical industry, and with the desire to make the appreciation enduring and constructive, as Mr. Coffin's life and work have been." The Charles A. Coffin Foundation is a fund of \$400,000, the income from which, amounting approximately to \$20,000 a year, is used for "encouraging and rewarding service in the electrical field by the award of prizes to the company's employees and by giving recognition to lighting, power and railway companies for improvement in service to the public, fellowships to graduate students and funds for research work at technical schools and colleges."

It will be recalled that under the conditions of the foundation it is provided

that an annual award of the Charles A. Coffin gold medal will be made to that electric railway company in the United States which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well-being of the public and for the benefit of the industry. It is also specified that the company receiving the medal shall receive \$1,000 for its employees' benefit or other fund. A similar award is made within the electric light and power industry.

During the war Mr. Coffin, despite his years, organized in 1915 the War Relief Clearing House for France and her allies, an organization later consolidated with the American Red Cross, and he remained active in the work of the latter body throughout the conflict. For his services France made him an officer of the Legion of Honor and Belgium and Serbia also decorated him. Honorary degrees were conferred upon him in his later years by Union, Bowdoin and Yale Universities. But these and other honors were unsought by Mr. Coffin and lightly worn. His distinguishing characteristic was extreme modesty, avoidance of ostentation and dislike of any personal publicity. His desire was to sink his own individuality in that of the General Electric Company.

HAD MANY BUSINESS CONNECTIONS

Mr. Coffin was born in December, 1844, in Somerset County, Me. He was a shoe manufacturer in Massachusetts prior to 1881, when, with others, he purchased the Thomson-Houston Electric Company, then established at New Britain, Conn. He was active in the management of this pioneer electrical manufacturing company and soon began to extend the scope of its operations. He purchased control of the Excelsior Electric Company, the Schuyler Electric Company, the Van Depoele Electric Railway Company, the Brush Electric Company and the Bentley-Knight Electric Company, and finally he organized the Thomson-Houston International Electric Company to act as agent of the home company in foreign lands. In 1892, realizing the benefits that would follow a consolidation of the Thomson-Houston Electric Company and the Edison General Electric Company, the two leading factors in the trade, he succeeded in blending these two concerns into the General Electric Company, of which he became president, retaining this office until 1913, when he surrendered it to become chairman of the board of directors. As chairman he served until May, 1922. He was thus 77 years of age when he retired from exercising or sharing executive control of the company which he did perhaps more than any other man to bring to its pre-eminence in electrical manufacturing.

Despite his age, Mr. Coffin kept up many business associations. He was a director of the General Electric Company, the Electrical Securities Corporation, the International General Electric Company, Inc., Light & Power Securities Company, the Underhill Development Corporation, the Union Carbide & Carbon Corporation, and the United Electric Securities Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

The Week in American Industry Analyzed

Chart No. 135 of the National Industrial Conference Board shows the changes in hours in the normal or prevailing work week in American industry as a whole and the situation in the major groups of industries in 1923. It discloses that the proportion of wage earners working on a schedule of more than 54 hours a week has decreased almost continuously since 1909, which is the first year in which statistics of this kind were gathered by the United States Census Bureau. The proportion of wage earners working on schedule of 48 hours or less per week increased slowly from 1909 to 1914 and very rapidly during the war. Since 1921 a week of less than 48 hours has become more prevalent. In 1923 nearly 80 per cent of the wage earners in the manufacturing industries were employed on a schedule of 54 hours a week or less.

The chart pictures the great gain of leisure for industrial workers which improved management and increased productive efficiency in industry have made possible. It shows also the tendency of industrial organization since the war to adjust its working schedule to a more stable basis, following the wide changes during the war period.

Lower Prices on Tires

Tire manufacturers have announced reductions in prices of from 10 to 25 per cent on casings of bus size and from 12 to 18 per cent on tubes. The cut is regarded by observers as due to a desire

to overcome sales resistance, for the companies are not yet profiting by the lower price of crude rubber. Beneficial results of the cut have already been noted by Akron tire companies. Increased sales and production are reported by most factories, with prospects that the volume of business during the next two or three months will be the largest in the history of the industry.

Tire prices are now back to levels of late 1924 and early 1925. In fact they are almost as low as they have ever been, despite the fact that crude rubber costs about twice what it did in 1920 and 1921. Improvements in tire construction have also resulted in a greatly increased tire life.

Manufacturers report a constant increase in the demand for balloon tires for buses. Not only are new buses being equipped with balloon tires but bus operators are, to some extent, substituting the balloon equipment for high-pressure casings.

Tubular Construction of Castings Overcomes Crossing Difficulties

In the early days of manganese steel castings the manufacturers of railway crossings were confronted with two serious problems, the initial pounding down of the points and adjoining receiving surfaces and the frequent cracks occurring at the bottom of the flangeway intersections. The pounding down took place within the first 60 days of service and amounted from $\frac{1}{2}$ to $\frac{3}{4}$ in. After this initial compression the steel became fixed and was subject only to abrasions. The original pound-

ing, however, resulted in rough riding, increased maintenance cost and a decreased life of the structure. The metal was forced into the flangeways, causing the latter to become unduly narrow. To meet these objections several special process crossings were brought out, among these being the Amsco process, wherein extra metal is cast upon the receiving surfaces and mechanically compressed at the foundry so that the metal becomes fixed on the true surface of the member.

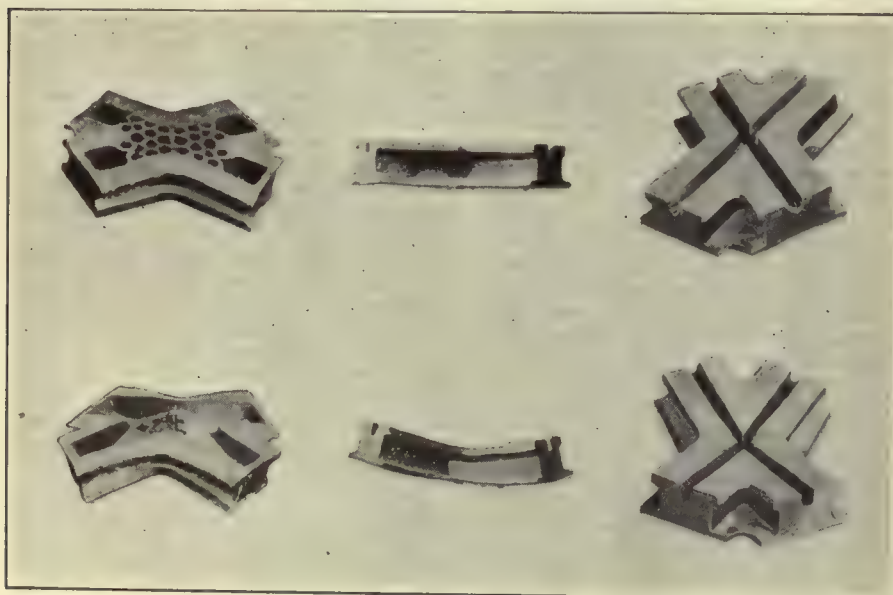
The Amsco process attacked the second problem, namely, that of overcoming unsoundness in the metal due to excessive thickness at the intersection, by developing a tubular construction formed by introducing a series of cored holes on the underside of the crossing. In this way a solid thickness of $1\frac{1}{2}$ in. of metal is provided under the tread and 1 in. under the flangeway, while the remaining depth under the flangeways and the treads consist of a series of ribs approximately $\frac{3}{4}$ in. in thickness.

An inspection of more than 100 Amsco crossings, after they had been in service from six months to $1\frac{1}{2}$ years, disclosed that no receiving surface was depressed more than $\frac{1}{8}$ in. and in the majority of cases the depression was less than $\frac{1}{16}$ in., according to the American Manganese Company, which holds the patents on these crossings. It is also claimed that the tubular construction permits of a high degree of resiliency and at the same time allows the section insuring uniform treatment of the metal. In other words, a more thorough heat treatment of the thinner metal section at the difficult intersection point is made possible. Attention is called to the fact that this is solid construction throughout and must be compared on this basis with various types of built-up crossings. Several other types of solid crossings that have met the fundamental difficulty described heretofore in various other manners are also on the market. Amsco crossings have been used extensively in steam railroad work, but are also claimed by their makers to be suitable for electric railway use.

Unusually Complete Catalog of Rail Sections

More than 125 full size drawings, dimensioned in inches and in the metric system and showing standard rail sections and rail accessories, are included in the new rail catalog issued by the Carnegie Steel Company, Pittsburgh, Pa. On each section information is given on the properties of the section, such as area, weight per yard, moment of inertia, section modulus, for both head and base; ratio of the moment of inertia to the area, ratio of the section modulus of the head to the area and gross tons per mile of single track. In addition to the drawings of rail sections and angle bars a number of tables are included in the front giving valuable information.

The pages are $8\frac{1}{2}$ in. x 11 in. and are arranged in a loose-leaf binder with flexible leather cover. Altogether the catalog is very nicely arranged and will prove a valuable reference book.



At the Top Are Shown Views of the Amsco Tubular Crossing, While the Three Lower Views Show the Old Type Standard Construction

The views at the left show the bottoms of the two types of crossings, the tubular reinforcing of the Amsco crossing preventing the breaking down indicated on the

right. The illustrations in the middle and at the right show the manner in which the two crossings react to the initial pounding down by car wheels.

Where Is Your Car in This Exhibit?



Additional units to the Municipal Auditorium at Cleveland, Ohio, which will be the home of the electric railway convention to be held in Cleveland Oct. 4 to 8, inclusive, as the artist conceived them, are shown in the accompanying illustration.

Adjoining the auditorium will be the electric car exhibit. Already space for

about twenty cars has been requested, but this is not half as much as needed. Freight rates are low to this central point, and the Cleveland Railway will handle these exhibit cars, including unloading, placing, washing and reloading after the convention, at a nominal charge, probably not exceeding \$25 a car.

To the left is the 600-ft. building to be erected. This building is to be 200 ft. wide for about half its length and 100 ft. wide for the balance. It will be constructed of steel and stucco, with a solid wood floor. Connecting it with the present auditorium to the right is the wide canopy as illustrated. The entire exhibit will be compactly arranged.

Large Motor-Generator Locomotives for Great Northern

Construction work is being rapidly pushed by the American Locomotive and General Electric Companies on two large motor-generator type electric locomotives for the Great Northern Railway similar in general to those being secured by the New York, New Haven & Hartford Railroad. The two locomotives weigh 250 tons each, with 200 tons on the driving wheels. They are to be used in connection

Length inside knuckles.....	73 ft. 6 in.
Length inside cab.....	61 ft. 0 in.
Height inside cab.....	13 ft. 11 in.
Height over trolley locked down.....	15 ft. 3 in.
Total wheelbase.....	60 ft. 0 in.
Rigid wheelbase.....	15 ft. 10 in.

Total weight.....	509,800 lb.
Weight on drivers.....	409,800 lb.
Weight per driving axle.....	68,300 lb.
Weight per guiding axle.....	50,000 lb.

Diameter of driving wheels...	54 in.
Diameter of guiding wheels...	36 in.

with the extension of the railway electrification from Skykomish to Wenatchee, a distance of 80 miles. In connection with this extension of electrification a 7½-mile tunnel is being constructed through the Cascade Mountains, which will lower the present summit 500 ft. The new line will substitute 9 miles of practically straight track for 18 miles of very curved and heavy grade line.

The tractive power of the locomotives is exerted by two three-axle trucks, each equipped with three 750/1,500-volt direct-current motors. Power will be received through a pantograph trolley from the 11,000-volt, single-phase, 25-cycle line, transformed to 2,300 volts and then converted through a 2,500-kw., three-unit

synchronous motor-generator set to direct current.

Each motor is connected to the axle through twin cushion type gears. Two motors are permanently connected in series. The three-unit set consists of a centrally located motor with a 1,250-kw. direct-current generator at each end. By means of guiding axles at each end of the unit provisions are made for operating at speeds up to 40 m.p.h., with a maximum emergency speed of 50 m.p.h. Type PCL control is provided with arrangements for multiple-unit operation of the two locomotives.

Regeneration will be obtained by controlling the excitation of the traction motor fields. The use of regeneration permits the use of the motors as a brake, the power generated in this way being fed back into the transmission system. A high-speed circuit breaker is used to protect both the locomotives and the supply lines from short circuits. The two pantograph collectors will have a range of from 16½ to 26 ft., one being used as a spare.

The maximum tractive effort of the locomotive, based on 30 per cent coefficient of adhesion, is 122,940 lb. The principal weights and dimensions are given in the accompanying table.

Bookings of G.E. for Quarter Up 10 per Cent

Orders received by the General Electric Company for the first six months of 1926 totaled \$165,405,720, representing an increase of 10 per cent over the \$150,315,228 booked in the corresponding six months of 1925. For the three months ended June 30 this year orders totaled \$78,972,062, compared with \$66,468,992 for the second quarter of 1925, an increase of 19 per cent. In the first six months of this year there were 152

working days, including Saturdays, showing General Electric orders received thus far this year have been at a rate of better than \$1,000,000 a day.

Hereafter the company will report earnings quarterly to its stockholders. For a long time the officers have been developing plans for reporting earnings more frequently than has been the practice. To carry out the plan of sending quarterly statements with the dividends, it will be necessary to change the dividend date from the 15th to about the 25th of the month. Accordingly the next quarterly dividend will be payable on or about Oct. 25, 1926, and will be accompanied by a statement of orders received and earnings for the first nine months of this year.

Giant Converter Just Installed by N. Y. Rapid Transit

Installation has been made of the largest automatically controlled synchronous converter for railway service at the Avenue T substation of the New York Rapid Transit Corporation, New York, N. Y. The machine is a 4,000-kw., 575-volt, direct-current, shunt-wound converter and is supplied from a 3-phase, 4,200-kva., 11,000-volt, 25-cycle power transformer. The high-tension connections of the transformers are connected in star for starting and in delta for full secondary voltage when the running breaker is closed.

An interesting feature of the equipment is the method of operation by means of supervisory control. To start up the machine the operator at the adjacent New Utrecht station operates a small telephone key, which initiates the operation of the automatic supervisory relay equipment, resulting in the closing of a relay at the substation to start the machine. The machine then automatically starts and

connects itself to the alternating-current and direct-current systems without an attendant.

In addition to starting up the machine, supervisory control will regulate other operations, such as shutting down the machine, operating thirteen feeder breakers, closing or opening the high-tension breakers and closing or opening any of the six track breakers. The dispatcher has at all times an indication of the position of all the breakers listed above, of the position of the main current breaker, and even of the opening of the substation door. By a unique method of remote metering the total current furnished by the unit may be read continuously. By a selective method the current in any one of the individual feeder circuits may also be read by the dispatcher.

A control line of five wires is used between the dispatcher's office and the station. Four of these wires are used for supervisory control, while the fifth is used for the continuous meter reading of the load. The station is equipped with Westinghouse switching equipment, converter and transformer.

Wood Preserving Treatment Very Effective in New Orleans

As an example of the efficacy of preservative treatment for railway ties, the June issue of *Wood Preserving News* carries an account of a number of ties which were recently removed after fourteen years of service in New Orleans. When it was decided recently to widen North Rampart Street for a distance of approximately $\frac{1}{2}$ mile in order to break the bottleneck which had been impeding traffic in the central portion of the city, it was found advisable to place the street car tracks on

the parkway in the center of the new connecting street. The line had been laid approximately fourteen years before, using hewn Southern pine cross-ties creosoted under pressure and laid in the concrete roadbed. The published account declares that the treated ties were found to be in perfect condition and were stacked in the storage yard of the railway company to be used in future installations where long life and freedom from decay are essential.

Describing the track installation which was made in the parkway, *Wood Preserving News* goes on to state:

"The new track is laid with strong Southern pine cross-ties treated with 6-lb. creosote per cubic foot by the empty-cell process and imbedded in concrete. The poles on this highway are Southern yellow pine treated by the empty-cell process with a final retention of 8-lb. creosote per cubic foot and the cross-arms are Southern pine similarly treated."

Track and Line

Interurban Traction Company, Helena, Ark., has started to repair its line through the business district. After completion of the work the city will begin resurfacing and repairing other parts of the street under a separate contract.

Wheeling Public Service Company, Wheeling, W. Va., plans to replace old rails and ties. Old paving blocks will be relaid after the tracks have been repaired.

Washington-Virginia Railway, Washington, D. C., has been instructed by the Public Utilities Commission of the District of Columbia to replace all

broken portions of the track substructure, repair all rail joints and restore its track to proper line and grade on Twelfth Street and on C Street. This work is to be started not later than July 15, 1926, and be fully completed by Sept. 15, 1926.

Trade Notes

Walker Gilmer, who has been associated with L. H. Gilmer Company for twenty years, has resigned his connection as chief of engineering, though remaining as a director of the company. He contemplates locating in Detroit, Mich., where he will do consulting and sales engineering and development work.

General Electric Company, Schenectady, N. Y., has announced that F. E. Case, who for many years has been in charge of the railway equipment engineering department of the General Electric Company, has had added to his responsibilities the supervision of the railway motor and railway locomotive engineering departments.

Timken-Detroit Axle Company, Detroit, Mich., has announced that George E. Watts, formerly with Duff Manufacturing Company, Pittsburgh, has joined it as a railway representative with his headquarters in Atlanta. Mr. Watts will call on the officials of the electric and steam railways in the South and endeavor to co-operate with them in the work of extending their lines by motor coaches and motor trucks.

Woonsocket Manufacturing Company, Providence, R. I., manufacturer of all types of bus bodies, announces the appointment of John D. Baukat to be vice-president and sales manager of the company, with offices at 2607 Grand Central Terminal Building, New York City.

New Advertising Literature

Sullivan Machinery Company, Chicago, Ill., has issued Bulletin No. 76-G and 83-B. The first describes portable single and double drum electric hoists, while the latter is a second edition illustrating single and two-stage straight-line air compressors for belt drive.

Engberg's Electric & Mechanical Works, St. Joseph, Mich., has issued bulletin No. 302-B, which is to supplement catalog 302 covering Engberg's vertical engines and giving comprehensive horsepower tables. New bulletin 601 has also been issued. This fully describes and illustrates Engberg direct and alternating current generators and their application to internal combustion engines. Bulletin 801 covers alternating-current, direct-connected generating sets.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued the second of a series of hanger cards on motor maintenance data. The first card of this series was on the subject of axle and armature bearings and was issued about a month ago. The most recent card describes the winding insulation and the banding and core insulations.

ELECTRIC RAILWAY MATERIAL PRICES—July 13, 1926

Metals—New York		Paints, Putty and Glass—New York	
Copper, electrolytic, cents per lb.	14.225	Linseed oil (5 bbl. lots), cents per lb.	11.80
Lead, cents per lb.	8.20	White lead in oil (100 lb. keg), cents per lb.	15.25
Nickel, cents per lb.	35.00	Turpentine (bbl. lots), per gal.	\$0.88
Zinc, cents per lb.	7.90	Car window glass, (single strength), first three brackets, A quality, discount	84.0%
Tin, Straits, cents per lb.	63.25	Car window glass, (single strength), first three brackets, B quality, discount	86.0%
Aluminum, 98 to 99 per cent, cents per lb.	27.00	Car window glass, (double strength) all sizes, A quality, discount	85.0%
Babbitt metal, warehouse, cents per lb.		Putty, 100 lb. tins, cents per lb.	4-6
Commercial grade	54.50	* Prices f.o.b. works, boxing charges extra.	
General service	30.50	Wire—New York	
Bituminous Coal		Copper wire, cents per lb.	16.00
Smokeless mine run, f.o.b. vessel, Hampton Roads	\$4.425	Rubber-covered wire, No. 14, per 1,000 ft.	\$6.25
Somerset mine run, Boston	1.95	Weatherproof wire base, cents per lb.	18.00
Pittsburgh mine run, Pittsburgh	1.75	Paving Materials	
Franklin, Ill., screenings, Chicago	1.825	Paving stone, granite, 5 in.	
Central, Ill., screenings, Chicago	1.50	New York—Grade 1, per thousand	\$147
Kansas screenings, Kansas City	2.425	Wood block paving 3 $\frac{1}{2}$ x 16 lb. treatment, N. Y., per sq. yd.	\$2.70
Track Materials—Pittsburgh		Paving brick 3 $\frac{1}{2}$ x 8 x 4, N. Y., per 1,000 in carload lots	51.00
Standard steel rails, gross ton	\$43.00	Paving brick 3 x 8 x 4 N. Y., per 1,000 in carload lots	45.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90	Crushed stone, 1-in., carload lots, N. Y., per cu. yd.	1.85
Tie plates (flat type), cents per lb.	2.30	Cement, Chicago consumers' net prices, without bags	2.10
Angle bars, cents per lb.	2.75	Gravel, 1-in., cu. yd., f.o.b. N. Y.	1.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.20	Sand, cu. yd., f.o.b. N. Y.	1.00
Steel bars, cents per lb.	2.05	Old Metals—New York and Chicago	
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	\$1.35	Heavy copper, cents per lb.	11.75
Hardware—Pittsburgh		Light copper, cents per lb.	9.75
Wire nails, base per keg	2.65	Heavy brass, cents per lb.	7.375
Sheet iron (28 gage), cents per lb.	3.125	Zinc, old scrap, cents per lb.	4.125
Sheet iron, galvanized (28 gage), cents per lb.	4.25	Lead, cents per lb. (heavy)	6.75
Galvanized barbed wire, cents per lb.	3.35	Steel car axles, Chicago, net ton	\$17.75
Galvanized wire, ordinary, cents per lb.	3.10	Cast iron car wheels, Chicago, gross ton	16.75
Waste—New York		Rails (short), Chicago, gross ton	17.25
Waste, wool, cents per lb.	12-18	Rails (relaying), Chicago, gross ton	26.00
Waste, cotton (100 lb. bale), cents per lb.		Machine turnings, Chicago, gross ton	8.25
White	13-17.50		
Colored	10-14		



Used by Coffin Medal Winners and other leading railways

To be specified by the prize-winning Pittsburgh Railways Company is significant in itself.

But this gains added significance when it is noted that so many other progressive railways equip their modern cars with Peacock Staffless Brakes.

Modern car design demands Peacocks because of their occupation of minimum platform space, simplicity of operation, low installation and maintenance costs, and tremendous braking power.

Facts and figures of past performances—installation estimates on your requirements — sent on request.
Write for them.

National Brake Co., Inc.

890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Company, Limited, Montreal, Canada

Peacock
Staffless
Brakes



PEACOCK Staffless Brakes

Bankers and Engineers

Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation

Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

43 Exchange Place

New York

STONE & WEBSTER

Incorporated

EXAMINATIONS REPORTS APPRAISALS
ON
INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

New York

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683 Atlantic Ave., BOSTON, MASS.

ALBERT S. RICHEY

ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

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WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly and Sunday Pass—Differential
Fares—Ride Selling

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A. L. DRUM & COMPANY

Consulting and Constructing Engineers

VALUATION AND FINANCIAL REPORTS
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE
COMMISSIONS

CONSTRUCTION AND MANAGEMENT OF
ELECTRIC RAILWAYS

230 South Clark Street, Chicago, Ill.

DAY & ZIMMERMANN, INC.

ENGINEERS

DESIGN - CONSTRUCTION - REPORTS

VALUATIONS - MANAGEMENT

NEW YORK

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CHICAGO

STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING
CONSTRUCTION

YOUNGSTOWN, O.

FINANCING
MANAGEMENT

JAMES E. ALLISON & CO.

Consulting Engineers

Specializing in Utility Rate Cases and
Reports to Bankers and Investors

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CONSULTING ENGINEERS

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ST. LOUIS

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Engineer—2301 Connecticut Ave., N.W., Washington, D. C.

TRANSPORTATION SURVEYS

Organized Traffic Relief and Transit Development
Co-ordinating Motor Transport, Railroad and City
Plans, Service, Routing, Valuation, Economic Studies

EXPERIENCE IN 20 CITIES

Railway & Industrial Bond Issues

WE are prepared to purchase entire bond issues of sizeable and sound American railroads and industrial companies.

*Address our office
at
42 Broadway, New York City*

HORNBLOWER & WEEKS

ESTABLISHED 1888

BOSTON
DETROIT

NEW YORK
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CHICAGO
PORTLAND, ME.

CLEVELAND
PITTSBURGH

Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

ARCHBOLD-BRADY CO.

Engineers and Contractors

SYRACUSE, N. Y.

KELKER, DELEUW & CO.

CONSULTING ENGINEERS

REPORTS ON

Operating Problems Rates Traffic Surveys

111 W. Washington Street, Chicago, Ill.

KELLY, COOKE & COMPANY

ENGINEERS

Operation and Management

Traffic and Transportation Surveys

PARKWAY at SIXTEENTH ST. PHILADELPHIA

THE P. EDWARD WISH SERVICE

50 Church St.
NEW YORK

Street Railway Inspection
DETECTIVES

131 State St.
BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

"Axle Specialist Since 1866"
Address all Mail to Post Office Box 515, Richmond, Va.

CAR AXLES

J. R. JOHNSON AND CO., INC.

FORGED STEEL AXLES

For Locomotives, Passenger, Freight and Electric Cars

Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large Shafts, Round Bars, etc.



STUCKI SIDE BEARINGS

A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.

ACME Window Curtain Fixtures

Noiseless — direct acting — enlarged friction surface — less parts — stronger — more easily and finely adjusted.

MORTON MANUFACTURING COMPANY

Chicago

UNA

**RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING ROD**

UNA Welding & Bonding Co.
Cleveland, Ohio.



“Appraised by The American Appraisal Co.”

Bankers, public utility and security commissions, know that the statement “appraised by The American Appraisal Company” means:

That the property has been examined by a staff of investigators, thoroughly experienced in public utility valuation, with the single objective of obtaining and recording all the facts which have a bearing on its value.

That these value facts have been translated into terms of money through the utilization of authentic statistical data and that the result is not one of individual opinion but of demonstrable truth.

That the appraisal has been made under the direction and control of an executive staff of valuation engineers with many years of experience, broad conceptions of all elements of value entering into public utility valuation work, who have passed on the final valuation and have qualified for expert testimony in its behalf if required.

That the value has been established by an organization which does not buy, sell, build, operate or finance property, is both disinterested and competent, and which has a keen sense of its moral responsibility.

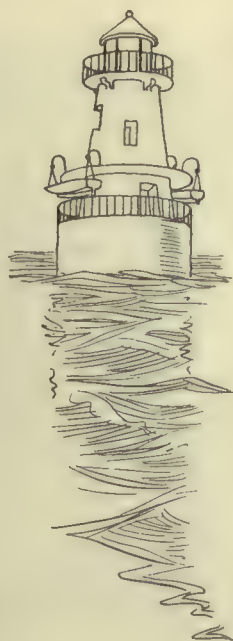
That an American Appraisal enjoys the confidence and respect of the investing public.

The American Appraisal Co.

MILWAUKEE

PUBLIC UTILITIES . INDUSTRIALS . REAL ESTATE PROPERTIES . NATURAL RESOURCES

A NATIONAL ORGANIZATION



Lost and Found

When you lose your pocket-book, your watch or dog, you advertise to find it. Then why not likewise advertise the equipment which *loses its identity in service?*

Many of the products which make up a trolley car are soon lost to sight in the construction of the car as a whole. Who knows, unless you tell them, what varnish has been used to insulate the coils? Who knows what the car floors are made of or who made the motors, seats or straps?

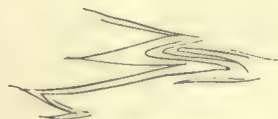
Trade mark labels cannot be conspicuously placed on all these substances and parts. Many of them, in fact, are permanently buried out of sight. Their identity is "lost" and can be "found" only when their maker *advertises* their existence to the travelling public or to railway operators.

As long as their identity is veiled or hidden, their use upon a thousand or a million cars has little or no

meaning. But advertise their presence and each new installation spreads the gospel of increasing use and becomes an aid to further sales.

Our business is to help the transportation advertiser make his products better known. This applies not only to manufacturers who sell equipment to the railways but to railway operators who sell service to the public. We are, in other words, experts in calling attention to the identity of any product or service in every branch of transportation.

Our own identity has been established by insertion of our lighthouse trade mark in the corner of the advertisements we prepare. We hope you like to read these identified advertisements and that you will not hesitate to call upon us for whatever advertising or public relations work you may wish to undertake in your own company.



Doyle, Kitchen & McCormick, Inc.

2 WEST 45th STREET, NEW YORK

An Advertising Agency





The Canadian Pacific Railway chose the Fageol Safety Car

After a minute and careful engineering investigation of the entire motor bus field, the Canadian Pacific Railway Company chose Fageol Safety Coaches to equip its bus operating subsidiary, the Canadian Pacific Transport Company, Ltd.

They bought on the basis of established and demonstrated facts—superior earning power, through greater passenger appeal, and lower “last costs.”

A year's operation has vindicated the judgment of the C.P.R. in their selection.

FAGEOL
SAFETY COACH

The Economy of the Fageol is Fundamental

Take for example the Hall Scott Engine, designed throughout to meet the severe requirements of motor bus work. It offers the following exclusive features:

1. Quickly replaced interchangeable units throughout.
2. A lubricating system which constantly refines and purifies the crankcase oil, holding it at its original viscosity for thousands of miles.
3. Complete cam and valve mechanism contained in interchangeable head. Valve grinding, maintenance work on head, and replacement of worn parts do not tie the bus up needlessly for hours or days.
4. Radiator mounted as unit with engine, so weaving of frame does not damage it.
5. Stainless steel pump shaft running in soft metal glands, eliminating troublesome pump leaks.
6. Higher compression ratio, to get more power out of the fuel.

7. Heavyweight aluminum alloy pistons, which limit carbon formation.

8. Combustion chamber design and valve arrangement which makes the necessity of valve grinding quite infrequent.

—and many more.

The final test of all endeavors to create a better, or more economical, more durable product is this: How does it work out in the hands of the user?

Operators who have used the Fageol Hall Scott engine for 300,000 miles or more say that there is no reason to believe that it will ever wear out. It is brutally strong, and the occasional replacement of a few simple parts brings the engine back to new condition.

Its phenomenally low maintenance cost, and its economy of fuel and oil, have been the chief contributing causes which have created the recognition for economy enjoyed by the Fageol Safety Coach.

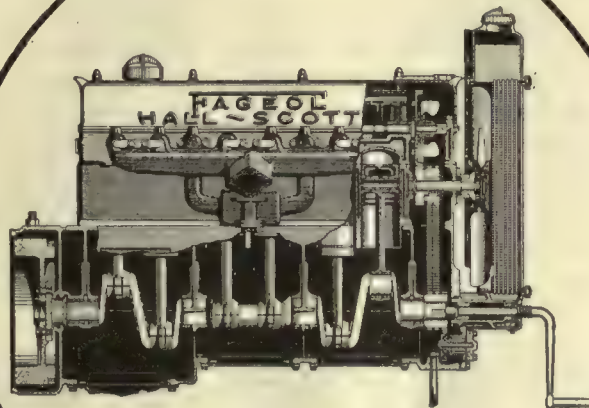
Ask for complete descriptive information.

THE FAGEOL COMPANY

A Division of

AMERICAN CAR and FOUNDRY MOTORS COMPANY

30 CHURCH STREET, NEW YORK, N. Y.





In England -

Warwick-Wright, Ltd., Swings to Generals

to make sure of the lowest possible tire cost per mile

Good news travels far—and fast! Across the broad waters of the Atlantic sped word of General's great records on the leading bus lines of America. Tales of the lower tire costs, the greater freedom from internal friction, the reduced bus operating costs made possible by Generals reached the ears of the purchasing agent for Warwick-Wright, Ltd. — famous bus operators of England.

Before long, Generals were being tested in side-by-side service against other well-known makes. Tire costs and mileage records of each make were noted to the fraction of a cent per mile. And these service records soon made apparent the greater worth of The General Tire.



The

GENERAL TIRE

— goes a long way to make friends

The result of those tests is revealed by the photo at the top of this page. The bus pictured is a Fageol Safety bus owned and operated by Warwick-Wright, Ltd. *And its tire equipment is 100% General!*

On some of the largest bus fleets in America and abroad, Generals have repeatedly demonstrated their ability to out-travel all competition. Carefully kept records of large fleet operators prove beyond argument that 100% General equipment means a substantial yearly saving in power and gasoline consumption, greater protection for the mechanism of the bus, the lowest possible cost of operation — the very things every fleet operator wants!

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.



Motor Coach Economy

Street railways operating Graham Brothers Motor Coaches profit by their substantial and demonstrated economies.

These savings extend straight through the extra long life of the coach—from the low initial investment to the final accounting for operation and maintenance.

Exceptional sturdiness, no excess weight and Dodge Brothers dependable engine are among the numerous economy advantages that set these vehicles apart in their field.

Coupled with this economy is the opportunity for greater frequency of service. Likewise a smartness of appearance that attracts patronage and a comfort and ease of riding that holds it.

21 Passenger
Street Car Type
Motor Coach
Complete,

\$3815

f. o. b. Detroit

GRAHAM BROTHERS

Evansville — **DETROIT** — Stockton
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED — TORONTO, ONTARIO

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



Time to Re-tire
Get a FISK
TRADE MARK REG. U. S. PAT. OFF.

"I did not neglect to specify Fisks"

Read this unusual testimonial from Mr. Clarence W. Cummings of Providence, Rhode Island. Specifying Fisk Transportation Cords has become a habit with successful bus operators.

"You will no doubt be interested to know that in placing my order for the bus shown in the inclosed photograph, that I did not neglect to specify my preference for Fisk Transportation Cords, as experience has taught me that the tire equipment should be selected just as carefully as any other detail which enters into the purchase of a new bus.

"I operate on a schedule from Providence, R. I., to Narragansett Pier and have had absolutely no delays for tire trouble.

"Be assured that I will specify Fisk on future business."

Fisk Transportation "Fillerless" Cords
are made in all bus and truck sizes.

The Fisk Tire Company, Inc., Chicopee Falls, Mass.



Transportation Companies Adopt Six-Wheel Idea

Detroit	100	Six Wheel	Single Deck
	36	Six Wheel	Double Deck
Cleveland	50	Six Wheel	Double Deck
Akron	28	Six Wheel	Single Deck
	2	Six Wheel	Double Deck
New York	24	Six Wheel	Single Deck
	1	Six Wheel	Double Deck
Kansas City	5	Six Wheel	Single Deck
	18	Six Wheel	Double Deck
Cincinnati	18	Six Wheel	Single Deck
Pittsburgh	9	Six Wheel	Single Deck

Smaller Fleets of Six-Wheel Single- and Double-Deck Coaches
in St. Louis, Boston, Washington, Montreal,
and many other cities are

EARNING BIG PROFITS



Full Particulars of all Models on request.

THE SAFEWAY SIX-WHEELER

THE SIX WHEEL COMPANY, 1800 W. LEHIGH AVENUE, PHILADELPHIA, PA.

Manufacturers of De Luxe, City, and Double Deck Type Six-Wheel Coaches

TIMKEN



In Atlanta—

Fifteen double-deck, gas-electric Fageols being operated by Atlanta Coach Company—subsidiary of Georgia Railway and Power Company—are averaging 45,000 miles a month.

The routes served by these vehicles encounter many steep grades, and the operating company reports "No axle trouble in this service, although the operating conditions are severe."

These vehicles are equipped with Timken Axles—front and rear.



THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

AXLES

The Public must believe Buses are safe

Public confidence and patronage are closely interwoven. They are the source of all revenue

The bus that has a tendency to skid when the brakes are applied is dangerous and, what is just as bad or worse from the standpoint of public confidence, it gives the impression of being more dangerous than it actually is.

Nine times out of ten or better a good driver can bring his machine up without an accident, even when he goes into a bad skid. But to the passengers a skid is remembered as an unpleasant experience, an accident narrowly averted, and bus transportation gets a black eye. Skidding strains the whole machine, too; is hard on tires and hard on the driver.

Skidding when the brakes are applied is due, primarily, to the application of un-

equal breaking pressures. One wheel absorbs most of the breaking effect, becomes locked, or drags, and the vehicle pivots, with consequent loss of control. This most dangerous source of skids can be removed by the use of Christensen Air Brakes—a system that automatically applies equal braking pressure to wheels on the same axle regardless of band wear or any such variable factor. Because, in the Christensen Brake, the power is applied directly, without the complication of outside levers, pullrods, shafts, knuckles, mechanical “equalizers” and cams, it can be depended upon to MAINTAIN the equalization of braking pressure applied. A permanent cure of skids from unequal braking pressures is effected.

To promote public confidence, to reduce operating expense, to relieve driver fatigue, and to prevent accidents specify Christensen Air Brakes on every bus you buy.

Christensen AIR BRAKES

CHRISTENSEN
6513 Cedar Ave.



AIR BRAKE CO.,
Cleveland, Ohio



WINDOWS DO MAKE A DIFFERENCE



Versare-Westinghouse Coach for Chicago & Alton R.R. Equipped with Edwards Metal Sash, in windows, deck lights and windshield. Note the clear vision afforded.

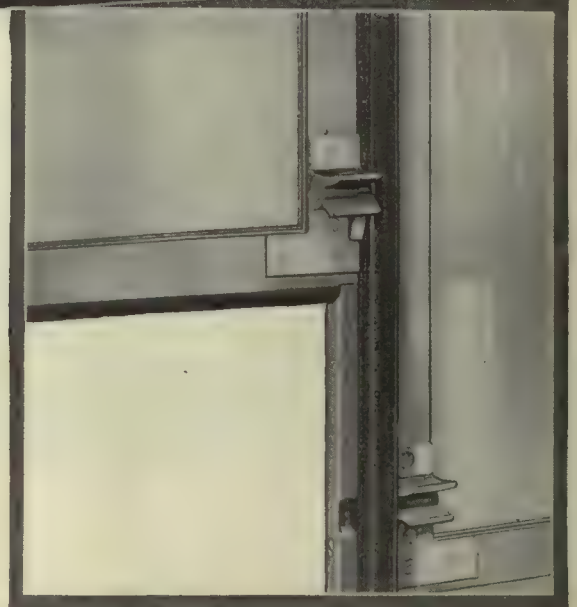
It's Light!

Eight wheels—a 120 horsepower engine—a 40 kilowatt generator—two 28 horsepower electric motors—a body with capacity for 35 seated passengers and 37 standing—and yet it is light!

This Versare-Westinghouse coach has achieved lightness through the use of aluminum in its body structure, and in this design and construction Edwards Metal Sash fits perfectly!

For Edwards Metal Sash is not only light in itself, but permits of lighter upper construction. And it surely makes bus windows perfect for both operators and passengers, as scores of body builders can attest.

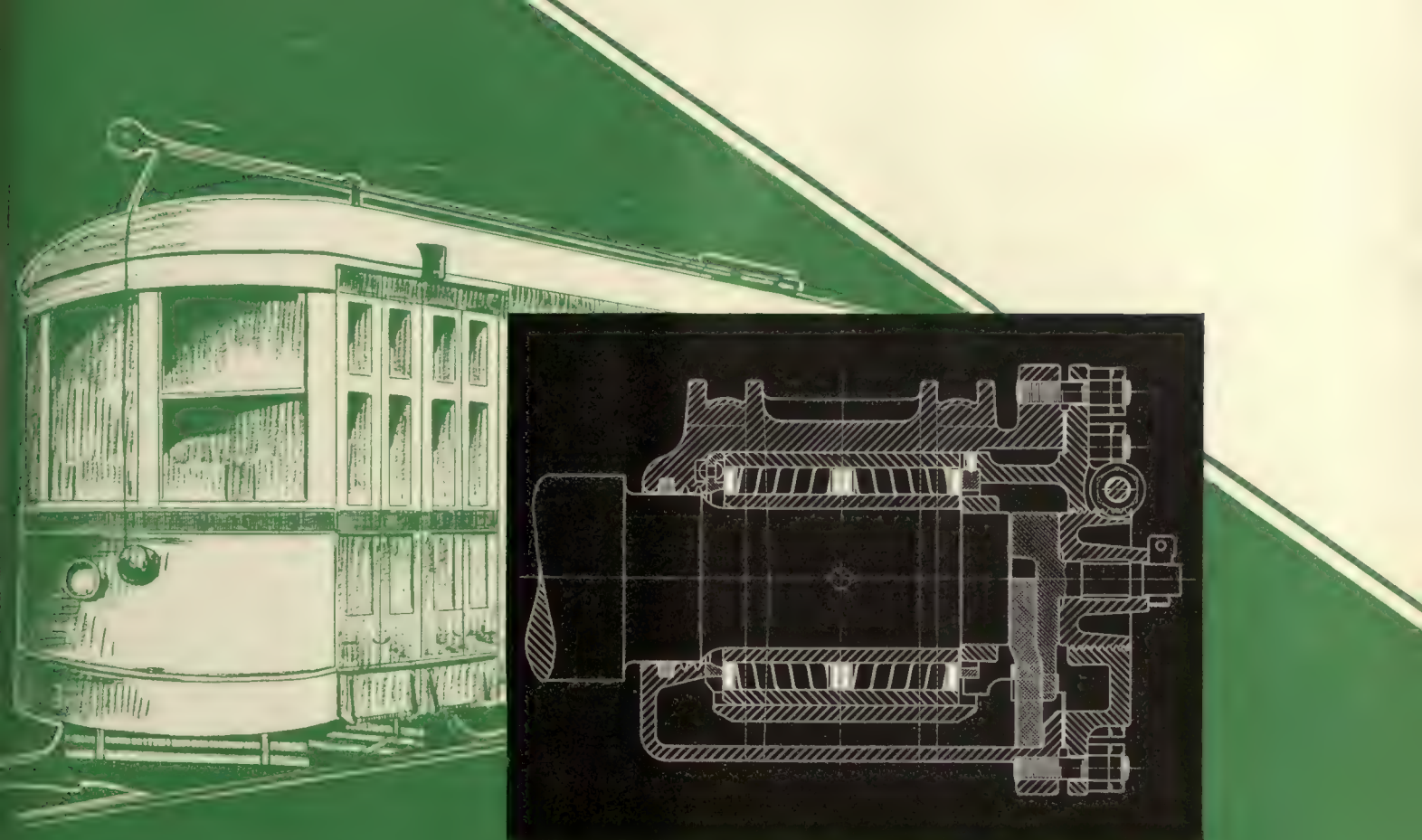
Send for catalog and full details of Edwards Metal Sash—without obligation on your part.



O. M. EDWARDS CO.
Syracuse, N. Y.

Canadian Representatives:
Lyman Tube & Supply Co., Ltd., Montreal and Toronto

Edwards Metal Sash

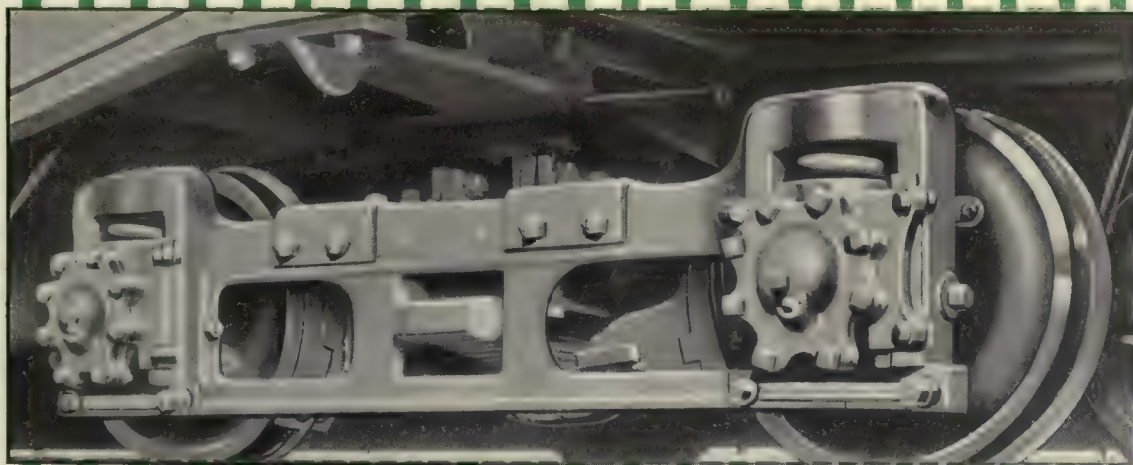


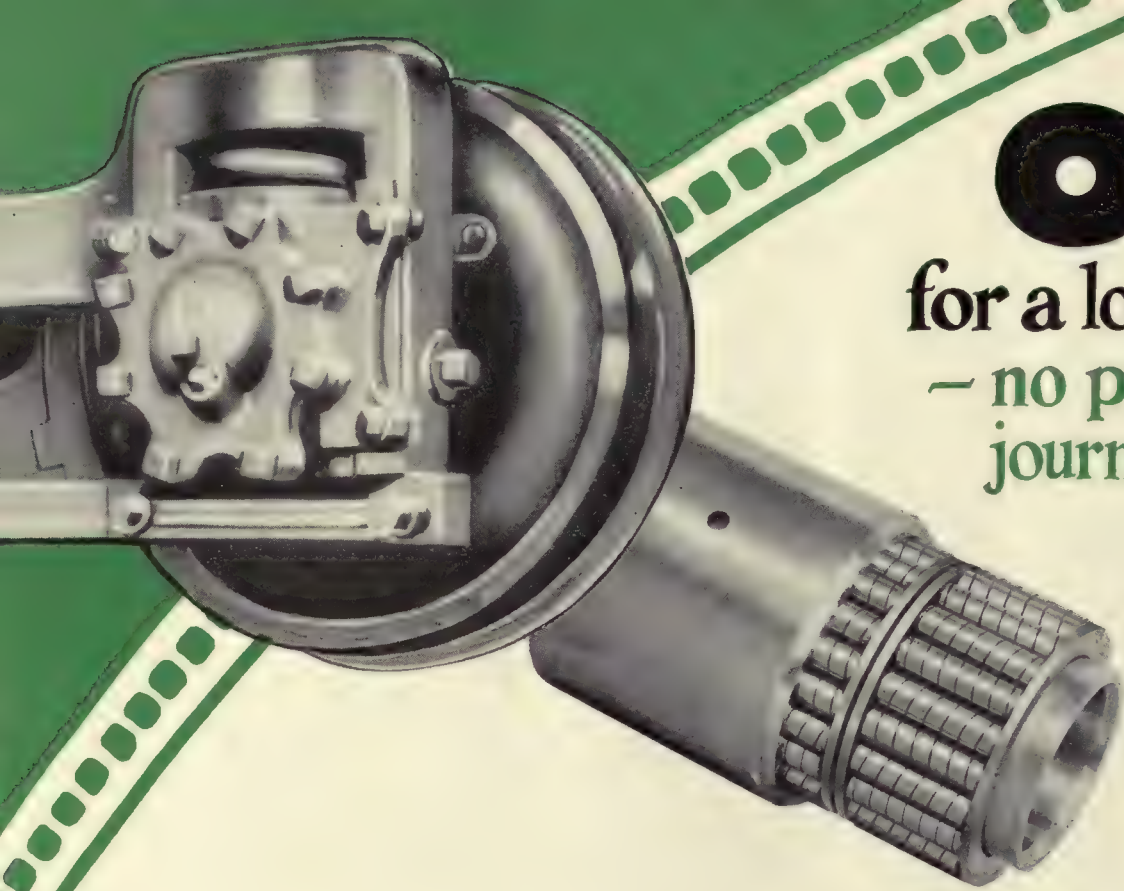
Modern truck design includes

Obsolete ideas concerning trucks are just as much a drag on the industry as is out-of-date thinking about car bodies and motor equipment. Trucks with plain bearings are wasting millions of kilowatt hours annually, struggling to overcome a friction load as unnecessary as surplus weight.

Plans and specifications are now available for your use, covering Hyatt Roller Bearing applications for every type of service. This equipment meets every A.E.R.A. requirement for standard equipment.

HYATT
QUIET ROLLER BEARINGS





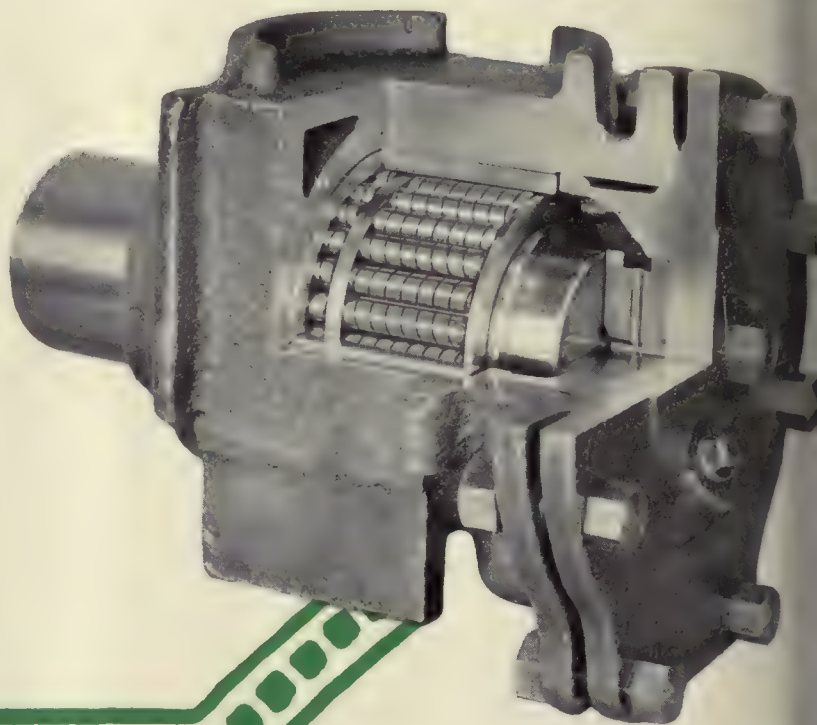
O.K.
for a longer period
— no pull-ins for
journal trouble

Maintaining the modern car made easier and cheaper—

The basis of reduced maintenance is the positive clean lubrication obtained with Hyatt Roller Bearings. Sealed in oil-tight journal boxes, the lubricant can neither leak nor become dirtied by grit or foreign matter. Helical rollers, wound alternately right and left hand, evenly distribute oil to every part of the bearing surface, so long as the oil level in the box touches the roller assembly.

With positive lubrication, hot boxes are eliminated and other journal bearing maintenance is reduced to a minimum. The lid is bolted tight to the box, and no waste or other packing is used. Pull-ins for journal trouble are practically unknown. In fact, all maintenance on trucks is reduced to checking for loose bolts, and lubrication at intervals, which are less frequent than with ordinary bearings.

Hyatt Roller Bearings meet every A. E. R. A. requirement. They carry full standard loads in boxes which fit all standard trucks without change.

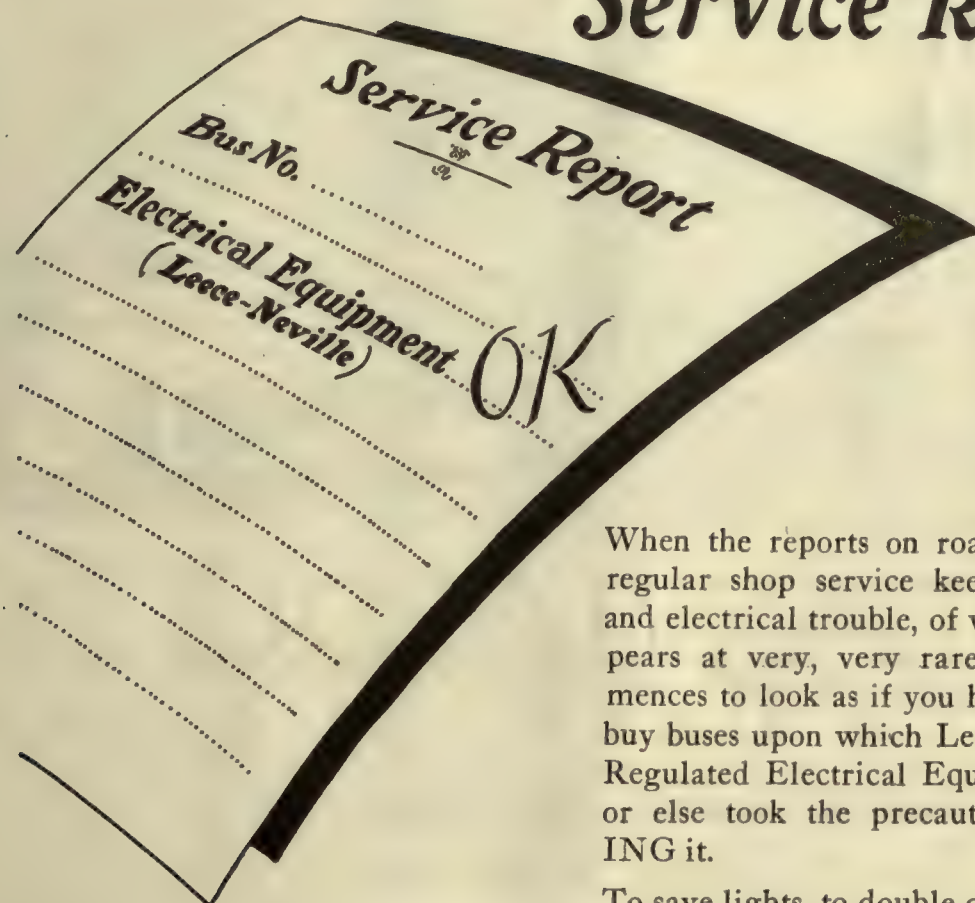


HYATT ROLLER BEARING CO.
NEWARK, N. J.

(Division of General Motors Corporation)

HYATT
QUIET ROLLER BEARINGS

Seldom Mentioned on "Trouble Call" or Service Reports

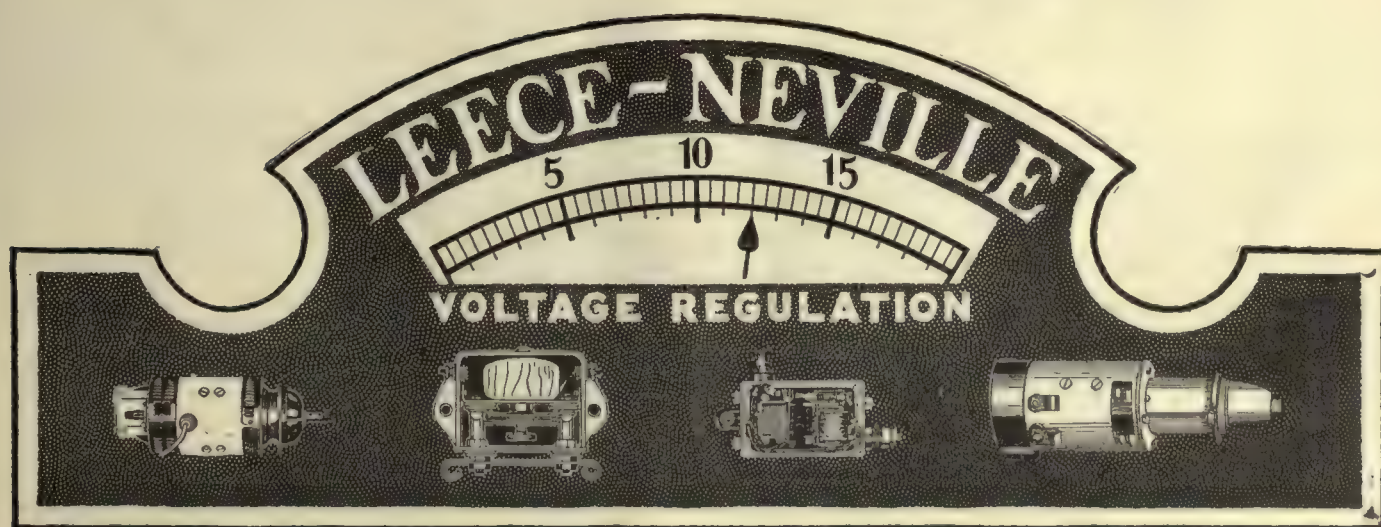


When the reports on road trouble-calls and regular shop service keep coming through, and electrical trouble, of whatever nature, appears at very, very rare intervals, it commences to look as if you had the good luck to buy buses upon which Leece-Neville Voltage Regulated Electrical Equipment is standard, or else took the precaution of SPECIFYING it.

To save lights, to double or triple battery life, to make even routine attention less frequent, and in general, to keep the electrical system off the trouble or service reports, don't trust to luck—Specify "Leece-Neville."

THE LEECE-NEVILLE CO.

Cleveland, Ohio



SUPERIOR LACQUERS FOR FIFTY YEARS



EGYPTIAN LACQUERS

FOR BOTH CARS and BUSES

Better looking than paint
 Longer lasting than paint
 Easier to clean than paint

and applied in a fraction of the time

Electric railway men have been looking for just such a finishing system as this.

Drying to a rich lustrous surface of infinitely greater depth and beauty than paint, Egyptian Lacquer fully measures up to modern standards of car and bus appearances.

And Egyptian Lacquer retains its beauty through an exceptionally long service life because its dense smooth texture does not collect dust, is easy to clean, and will not crack, blister or peel under any conditions likely to be met with in service.

Furthermore, where formerly it required anywhere from seven to fourteen days for a good paint job, it

takes but a fraction of this time to do a first class job with Egyptian Lacquer. Less sanding, less material and less skilled labor, to say nothing of very much less "shopping" time, these economies have made the Egyptian Lacquer System the choice of a rapidly growing list of prominent electric railway operators.

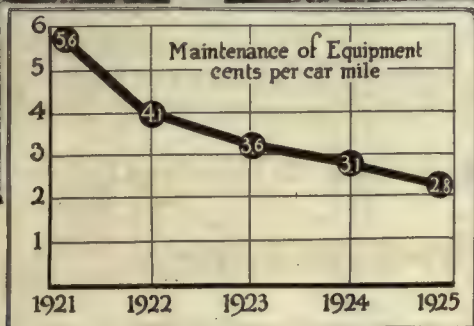
The Egyptian Lacquer System is simple in the extreme. Primers and finishes are sprayed on at hourly intervals with any standard spray painting outfit. No special equipment of any kind is needed.

Consult us concerning your next finishing or re-finishing job. We'll gladly demonstrate to your satisfaction. Bulletins on request.

THE EGYPTIAN LACQUER MFG. CO.

90 West Street, New York

"Railway doing well" in AUGUSTA, GA.



Maintenance of equipment in cents per car mile—1921 to 1925.

Modernization wins again!

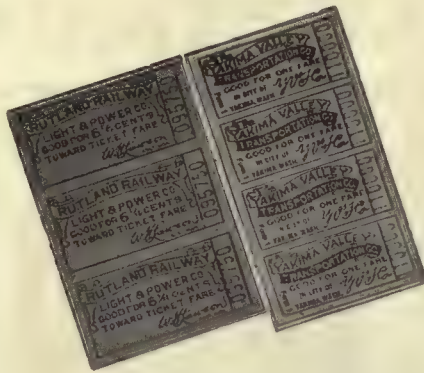
Now the story of Augusta can be told! Its rolling stock has been thoroughly modernized during the past four years with the result that maintenance expenses have been greatly reduced as shown above. Operating expenses also have been cut substantially.

Practically half the rolling stock operated consists of new modern Thomas-built cars—producing substantial economies which are responsible for the authentic report—"railway doing well" in Augusta.

PERLEY A. THOMAS CAR WORKS
HIGH POINT, N. C.



THOMAS BUILT CARS
are doing their share



Globe Ticket Features

Accurate Numbering

High Quality Printing

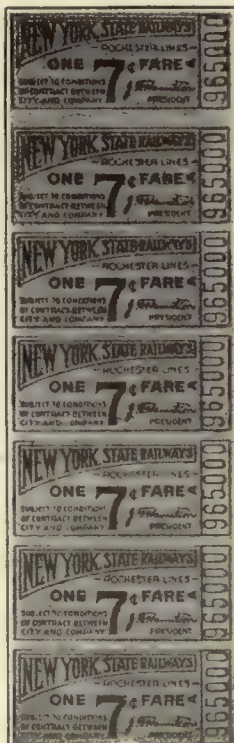
Protection Against Counterfeiting

Satisfactory Perforation

Deliver on Time



and don't forget the Transfers



GLOBE TICKET COMPANY

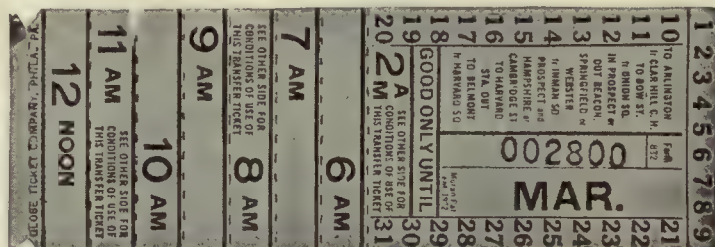
makers of tickets and checks since 1873

116 N. 12th St., Philadelphia, Pa.

Los Angeles

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DALLAS

EQUIPPED with
"STANDARD"
Rolled Steel Wheels
this car of the Dallas
Street Railway is serv-
ing well the leading
manufacturing city of
Texas.



Rolled Steel Wheels
Quenched and Tempered
Carbon Steel Axles
Coil and Elliptic Springs

STANDARD STEEL

WORKS COMPANY

PHILADELPHIA, PA.

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WORKS: BURNHAM, PA.



THE ONE great factor in the wearing out of machinery is friction. Machinery will rust, of course, if it is not protected from the weather, and it will corrode if exposed to acid fumes, but these are unusual conditions. Friction is the one agency that is continually at work while the machinery is running.

Friction is the cause of a large percentage of all repair and replacement costs. Reduce friction and there is an immediate reduction in these two items of your operating expense.

Reducing friction means choosing the right grade of oil for each piece of machinery. There is a right grade of oil for every bearing. This grade will permit the bearing to operate with the least possible wear and on the least possible power.

Standard Oils and Greases

are made in many grades to suit the lubrication requirements of every kind of machinery in use in the industrial world. The representative of the Standard Oil Company (Indiana) can tell you the correct grades to use on your equipment. Follow his recommendations and you will reduce your repair and replacement costs to the lowest possible figure.

STANDARD OIL COMPANY

(INDIANA)

General Offices: 910 S. Michigan Ave., Chicago, Illinois



Some common-sense thinking will result in your getting **Boyerized Parts**

Because of the special Boyerizing treatment—which gives them a glossy, glass-hard, armor-plate surface—Boyerized products outwear ordinary case-hardened steel parts three to four times.

They easily stand the grind of long hard service so that they not only cut maintenance costs but also guarantee a comfortable margin of safety between inspection periods.

Under such conditions it is merely common-sense to use Boyerized Parts.

Select some from the list below—then try them out on your own cars to convince yourself of their safety and economy.

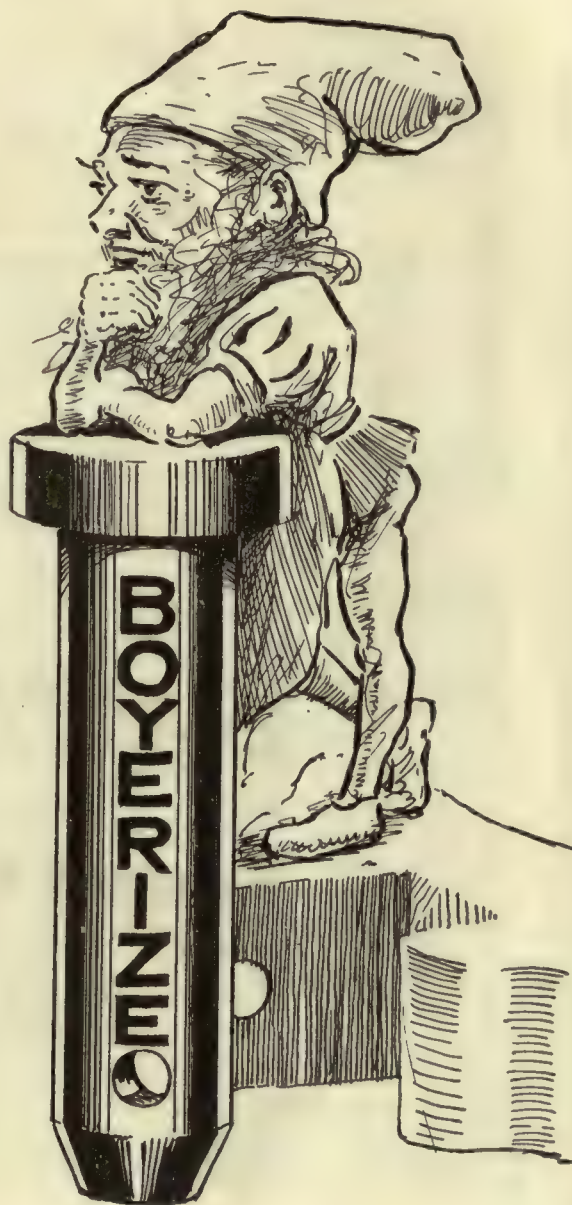
Brake Pins	Spring Post Bushings
Brake Bushings	Spring Posts
Brake Hangers	Bolster and Transom
Brake Levers	Chafing Plates
Pedestal Gibs	McArthur Turnbuckles
Brake Fulcrums	Manganese Brake Heads
Center Bearings	Manganese Truck Parts
Side Bearings	Bronze Bearings

Bemis Car Truck Company

Electric Railway Supplies
Springfield, Mass.

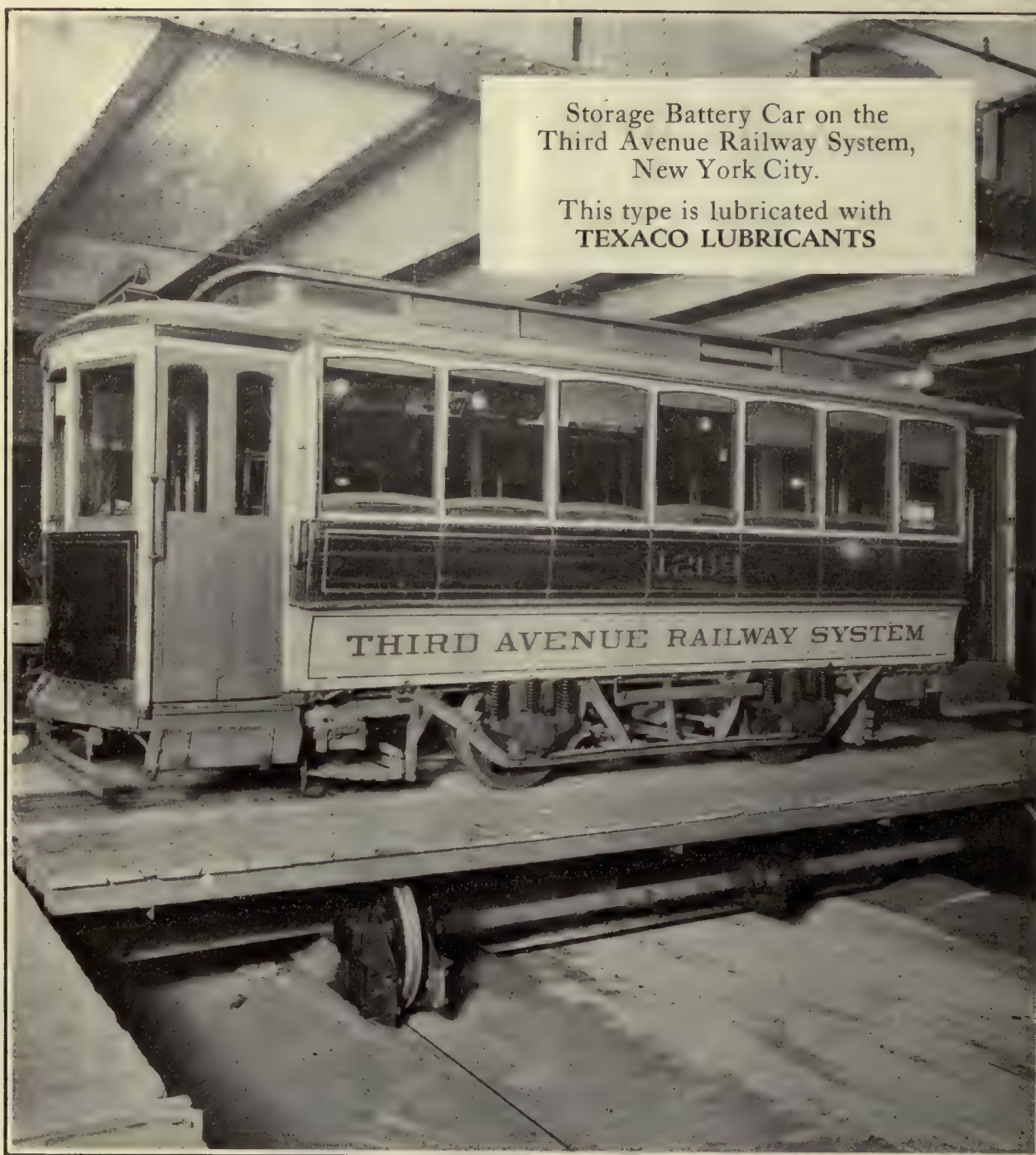
Representatives:

Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
W. F. McKenney, 54 First Street, Portland, Ore.
J. H. Denton, 1328 Broadway, New York City, N. Y.
A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.



The
McArthur
Turnbuckle





TEXACO



The Chosen Lubricant
of ELECTRIC RAILWAYS



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES



Eliminating the idle hour

USERS of industrial power, who have given thought and study to factory wiring problems, are today insisting upon the installation of Lead Sheathed Cables where power circuits are layed underground, in damp places, or wherever severe conditions exist.

Such specifications are evidence of a desire to install only wires and cables that insure against costly shutdowns—that eliminate the idle hour.

From copper bar—through many insulation processes—into the giant lead presses, and over the inspection mirrors to finished product, Rome Lead Sheathed Cable is constantly passing.

For all Rome Wires and Cables are manufactured from copper wire bar to finished copper wire—in our mills covering 20 acres of manufacturing floor space; under the careful supervision of a trained engineering staff.

*Stranded
Rubber Covered
Lead Sheathed
Cable*

ROME WIRE COMPANY, ROME, N.Y.

ROME WIRE

FROM WIRE BAR TO FINISHED COPPER WIRE



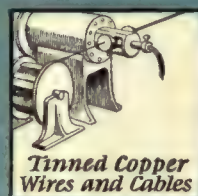
Antenna Wire



Weatherproof Wires and Cables



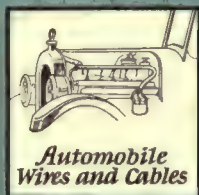
Trolley Wires and Cables



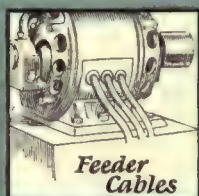
Tinned Copper Wires and Cables



Telephone Wires and Cables



Automobile Wires and Cables



Feeder Cables



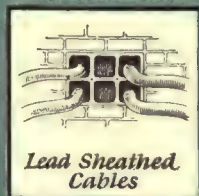
Extra Flexible Wires and Cables



Heater Cords



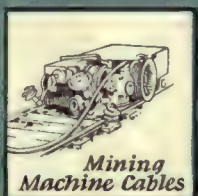
Lamp Cords



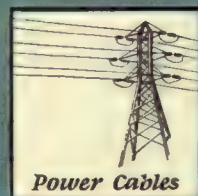
Lead Sheathed Cables



Magnet Wire



Mining Machine Cables



Power Cables



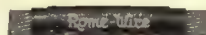
Radio Wires and Cables

THERE is a vast difference in the appearance of the huge Lead Encased Cables, and the fine strands of copper that go to make up magnet wire. Yet, both are manufactured by the Rome Wire Company.

And, if you study the Rome products, shown on this page, you will find, between these two extremes, a variety of types, sizes, and insulations sufficient to satisfy practically any need.

All of these wires and cables are made in Rome Mills, under Rome supervision, from wire bar to finished copper wire.

If you will let us know in what wires and cables you are interested, we will be glad to send you samples, catalogs, and other information that will be of help to you.



ROME WIRE COMPANY

Mills and Executive Offices: ROME, N.Y.

Diamond Branch: Buffalo, N.Y.

New York — 50 Church Street

Boston — Little Building

Chicago — 14 E. Jackson Blvd.

Detroit — 25 Parsons Street

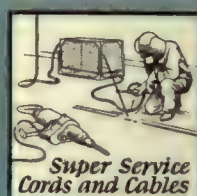
Cleveland — 1200 W. 9th Street

Los Angeles — J. G. Pomeroy, Inc., 336 Azusa Street

San Francisco — J. G. Pomeroy, Inc., 51 Federal Street



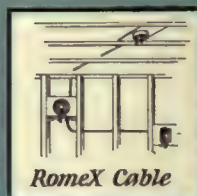
Slow Burning Wires



Super Service Cords and Cables



Rubber Covered Wires — Code 30% Intermediate



RomeX Cable



Copper Rod and Bare Copper Wire

A Quality Specification!

March 10, 1923

ELECTRIC RAILWAY JOURNAL

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Details of Philadelphia Order for 576 Cars

On Jan. 22 the board of directors of the Philadelphia Rapid Transit Company authorized the lease and purchase by car trust agreement of 576 cars of which 520 will be passenger cars. A brief note in regard to the order, which is said to be the single order for trolley cars in this country, was made in the issue of the ELECTRIC RAILWAY JOURNAL.

MANUFACTURERS OF EQUIPMENT, TOGETHER WITH TYPE FURNISHED

Air brakes	.....G.E. Co.
Armature bearings	.....Plain
Axles	.....Carnegie Steel Co.'s heat treated
Bumpers	.....Six-inch Channel reinforced
Car signal system	.....Brill's standard and push button contact bases—Faraday Type-E
Car trimmings	.....Malleable and bronze statuary finish
Center and side bearings	.....Brill's standard
Conduits and junction boxes	.....Galvanized
Control G.E. 2-K-68 with ratchet attachment	.....Control G.E. 2-K-68 with ratchet attachment
Couplers	.....Drawbar pockets
Curtain fixtures	.....Curtain Supply Co.'s No. 88
Curtain material	.....Double face pantasote
Destination signs	.....Hunter
Door operating mechanism	.....National Pneumatic Co.
Wheelguards	.....H. B. Life Guard
Gears and pinions	.....Tool Steel Gear & Pinion Co.
Head tanks	.....Peacock staffs
Heater equipment	.....Consolidated Car Heating Co.'s
Headlights	.....Crouse Hinds semi-lens
Bearings	.....Plain
	.....Plain cast-iron

1040

"Tool Steel" gears
pinions

go on this new equipment.

A quality specification.

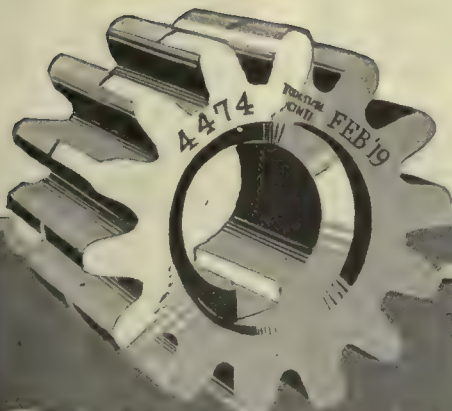
1923—1040 sets "Tool Steel"

1925— 200 sets "Tool Steel"

1926— 100 sets "Tool Steel"

Philadelphia believes in getting the best when they buy.

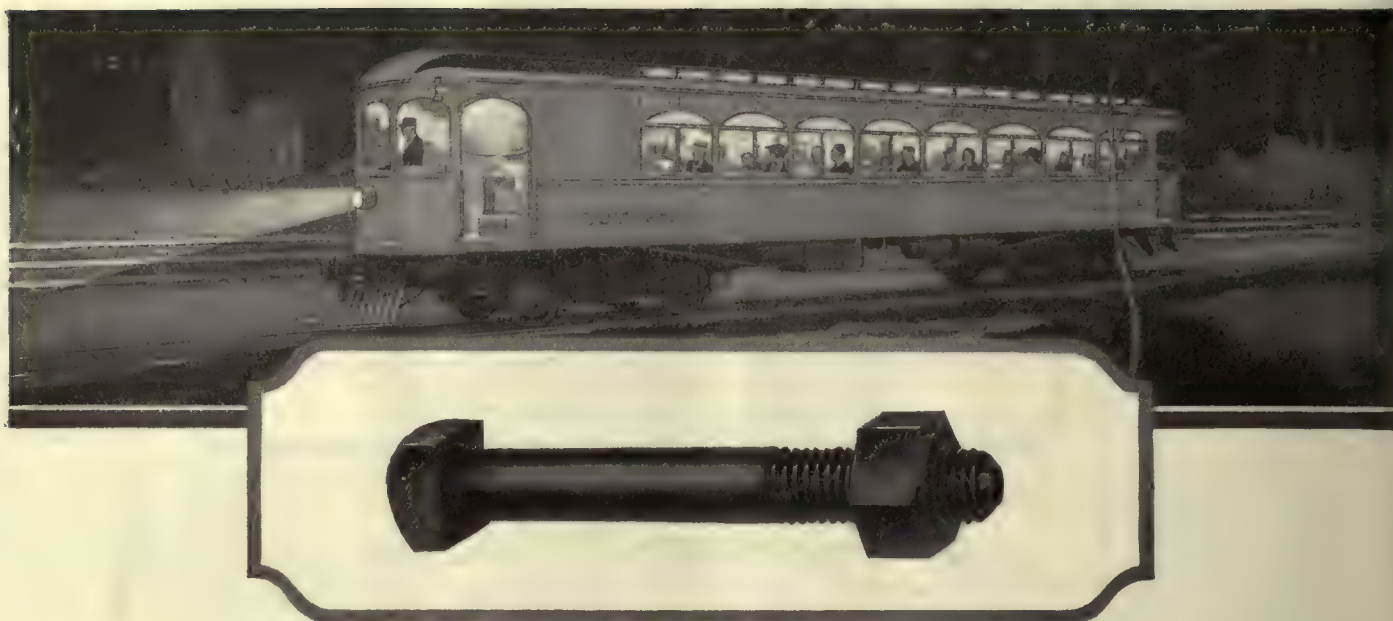
The Tool Steel Gear & Pinion Company
Cincinnati, Ohio



TOOL-STEEL QUALITY

GEARS AND PINIONS

The Standard of Quality



On Electric Railway or Motor Bus *The Best is the Cheapest*

Your past experience in repairs and up-keep generally must have demonstrated the uncertainty and the doubtful economy of bolts and nuts bought "at a price."

If you are expanding your lines by fleets of motor buses you must find the lesson that "the best is the cheapest" applies with redoubled force here.

Unusual speed, sudden stops, stresses of exceptional character all put a strain on

the bolts and nuts that only quality products can stand. See that your shops buy Empire bolts and nuts. They are more accurate, many degrees stronger than ordinary bolts and nuts and absolutely uniform. *Specify Empire:*

RUSSELL, BURDSALL & WARD
◎ **BOLT & NUT COMPANY** ◎
PORT CHESTER, N.Y.

Branch Office: Sears Building CHICAGO	Branch Office: General Motors Bldg. DETROIT	Branch Factory: ROCK FALLS, Ill.	Strimple & Gillette 500 Jackson Street SEATTLE	Maydwell & Harnell, Inc. 150-160 Eleventh Street SAN FRANCISCO
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Makers of Bolts, Nuts and Rivets Since 1893

EMPIRE *New Process* BOLTS





(Photo by Ewing Galloway, Inc.)

ORANGEBURG

FIBRE CONDUIT

**Specify the Harrington Joint**

The Harrington Sleeve Joint is more economical because it means less breakage, easier cutting and fitting, protection against seepage and electrolysis, and flexibility of line which aids in avoiding obstructions.

IN BRAZIL they pronounce "Orangeburg" differently but they ask for it just the same. Over 200,000,000 feet of this famous underground duct have been shipped to all parts of the civilized world.

JOHNS-MANVILLE

Sole Selling Agent for

The Fibre Conduit Company, Orangeburg, N. Y.

Johns-Manville Inc.

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Cleveland, 6300 Euclid Avenue
Boston, 55 High Street
San Francisco, 500 Post Street
Toronto, Can., 19 Front St., E.
Other branches in all large cities

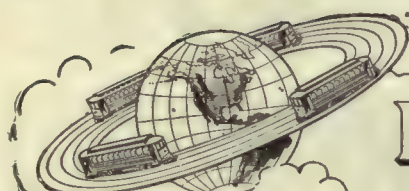
**Distributors
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Pacific States Electric Co.
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The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

NOARK

600 VOLT FUSES

*Protect Motors
and Schedules
because they*

"Blow on
**the dot"**

The Johns-Pratt Company

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Noark Fuses
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Noark Meter
Service System



Noark Railway
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J-P Molding Service
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Vulcanizing Packing
and Pump Valves



J-P Molded Auto
and Radio Parts



The 1926 Edition McGRAW Electric Railway Directory

The time your salesmen can save
would pay for it many times

"Who are the men I should talk to in the Blank Railway Company?"

You'll find the answer quickly in the 1926 Edition McGraw Electric Railway Directory. Keep a copy handy—in your desk, in your brief case. You'll need it.

Call on the right men—the men who specify or buy. If your salesmen cover wide territories, they can't be expected to know all the changes in personnel of the roads they call on.

Our records showed 65% in changes

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And your mailing list. Why not *know* in advance that you are reaching the men you *need* to reach. Build and check your mailing lists from the McGraw Electric Railway Directory.

Don't waste valuable time and effort in a \$300,000,000 market by misdirecting your sales program. Save both by returning the attached coupon.

Here are the inside facts

- 1—Complete list of every recorded electric railway company in the United States, Canada, Mexico and the West Indies.
- 2—Names and addresses of officials, superintendents, department heads and purchasing agents, corrected to date of report.
- 3—Addresses of companies operating buses.
- 4—Addresses of repair shops.
- 5—Mileage of track and bus routes.
- 6—Number and kinds of cars used.
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Price \$7.50 a Copy

10% discount for five or more

Directory
Department,
Electric Rail-
way Journal,
10th Avenue and
36th St., New York,
N. Y.

Gentlemen:—Will you please send me:

.....copies of 1926 McGraw
Electric Railway Directory, check
for \$..... enclosed.

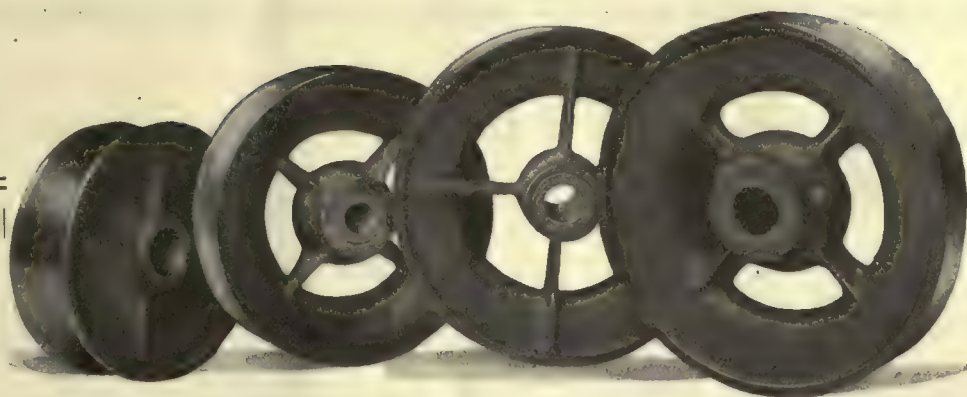
.....More complete information con-
cerning contents.

Name

Company

Street

City State.....



Are Your Trolley Wheels “Forget-Proof”?

A SPECIAL feature of the Columbia Trolley Wheel is the Bound Brook Oilless Bushing which makes lubrication “forget-proof,” and insures smooth operation.

These wheels, moreover, embody and combine the essentials of accurate balance, ample conductivity, and proper hardness to give maximum wheel mileage with least wear on wire.

Our standard trolley wheels are manufactured in three nominal sizes, namely $4\frac{1}{4}$ ", 5" and 6", but we also have on hand special patterns and are ready to make wheels to fill any individual requirements.



May we send you estimates on standard or special types of trolley wheels—or on any other of our products?

The
COLUMBIA MACHINE WORKS

and Malleable Iron Company

3303 Atlantic Avenue

Brooklyn, N. Y.

STATISTICS show that 20,000 people were killed on the streets and highways last year.

Accident prevention is a serious problem. Intelligent means taken to prevent accidents is one of the manifestations of thoroughgoing efficiency.

Eliminate accidents with your cars as far as humanly possible by equipping them with—

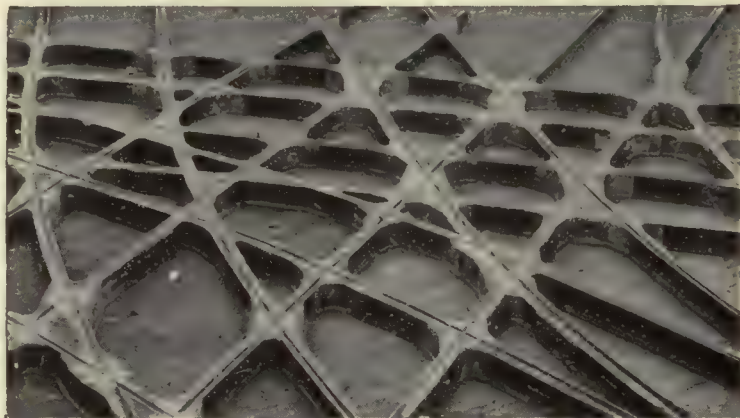
H-B LIFE GUARDS

manufactured by

The Consolidated Car Fender Company

Providence, R. I.

Wendell & MacDuffie Co., General Sales Agents
110 East 42nd St., New York, N. Y.



Forty-Five Years' Experience and the best of modern facilities are responsible for the excellence of Buda Trackwork

THE BUDA COMPANY

HARVEY, ILL.



Send us
your inquiries



Clean Commutation

There is no surer way of getting clean commutation at low cost for labor and brushes than by using U. S. G. Brushes. Service records have long since demonstrated this.

Composed of pure Mexican Graphitic Carbon compounded with other low resistance carbons, these brushes are made in many different types, and the composition of each type is adjusted to meet the particular service required under actual operating conditions.

There's a type of hard, dense U.S.G. brush especially designed for the electric railway field. Clean commutation, long life, little labor attention—are characteristic of its service.

Test them on your motors.



**Brushes
fill the bill**

Manufactured by

The United States Graphite Co.

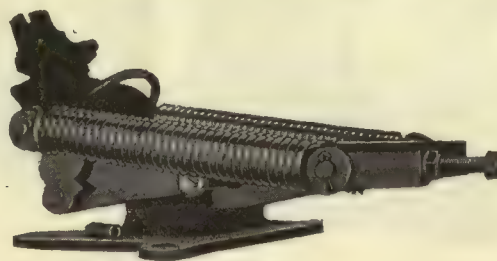
Saginaw, Michigan

New York
Chicago

Philadelphia
St. Louis

Pittsburgh
San Francisco

Nuttall



NUTTALL Tapered Roller Bearing Trolley Base

Type US No. 20A

Here is the latest Nuttall Trolley Base incorporating the famous Timken Roller Bearing — a tapered double-race roller bearing which has been designed by this manufacturer especially for trolley base service.

Particularly interesting features of this new base include extreme sensitiveness, with swiveling strains evenly distributed on bearings; oil and grease reservoirs for lubrication of bearings and pole socket axle pin respectively; quick, easy lubrication only once in six months.

Full specifications on request



R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

HASKELITE



Demonstrating Confidence

ELECTRIC railway men are demonstrating their confidence in the future of the industry by the purchase of modern new equipment and the maintenance of old equipment to the highest possible standard.

And they are demonstrating their confidence in HASKELITE and PLYMETL by the quantities of these structural plywood products which they are ordering for both new and old car requirements.

This confidence is based on experience. Practical railway men know that the HASKELITE—PLYMETL car is light, strong, quiet, well insulated and attractive in appearance. They know it is easy to repair a HASKELITE roof or a PLYMETL side panel but that the superior strength of these materials makes repairs few and far between.

If you have not yet had this experience personally we will be glad to send full information regarding the properties of HASKELITE and PLYMETL and a blue print booklet showing its application in street cars and buses.

Haskelite Manufacturing Corporation
133 W. Washington Street, Chicago

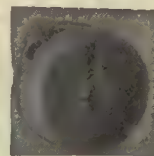
Canadian Representative:

Railway and Power Engineering Corporation, Limited,
Toronto and Montreal

Recent repair orders received from Grand Rapids Street Railway, Public Service Ry. of N. J., Milwaukee Electric Ry. & Light, Duluth Street Railway, Houston Electric, West Penn Railway, Lynchburg Traction & Light, Omaha and Council Bluffs Street Railway, and Columbus Railway Power & Light.

ERJ7-17 Gray

PLYMETL



Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

Earll Catchers and Retrievers

C. I. EARLL, York, Pa.

Canadian Agents:

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You're having brush trouble

CORRECT IT

USE LE CARBONE CARBON BRUSHES

They talk for themselves

**COST MORE PER BRUSH
COST LESS PER CAR MILE**

W. J. Jeandron

**Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.**

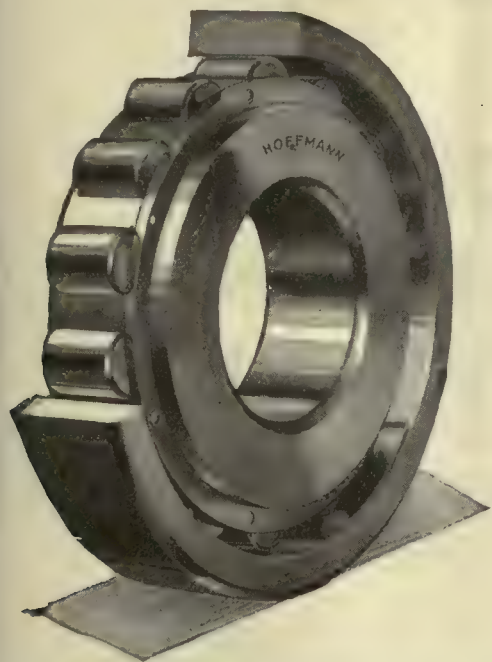
Pittsburgh Office: 634 Wabash Bldg.

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LOAD-ABILITY



Size for size, a "Hoffmann" has at least twice the steady load capacity of any ball bearing—and, in addition, a large temporary overload capacity to meet the demands of starting and emergency duty. Think what this means, in the way of a greatly increased factor of safety secured without any increase in dimensions of bearings.—*Write for Catalog 904.*

NORMA-HOFFMANN BEARINGS CORPORATION

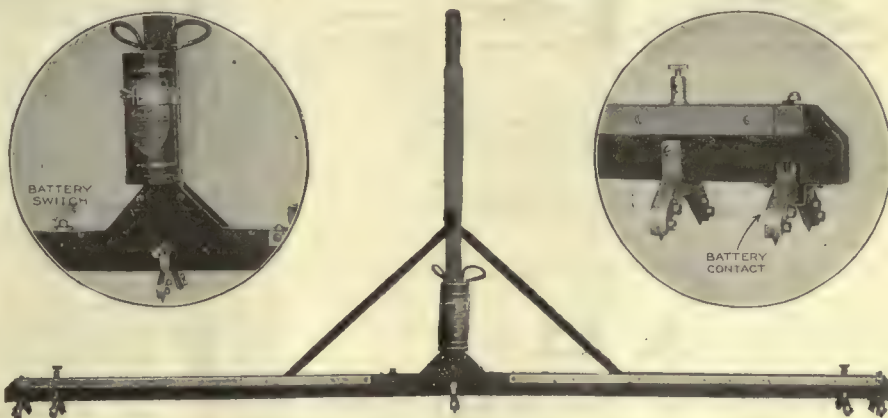
Stamford — Connecticut

PRECISION BALL, ROLLER AND THRUST BEARINGS

"HOFFMANN"

Why ROLLER-SMITH BBT Bond Tester

has proved
such a great
success in
less than a year



It fulfilled a demand for quick, accurate, economical testing of rail bonds. *That's all.* In doing this, however, it dispensed with heavy, clumsy and expensive battery equipment since it uses only a No. 6 dry cell.

It dispensed also with grids and other equipment necessary to obtain current from the line.

"Over thirty years experience is back of Roller-Smith"

ROLLER-SMITH COMPANY
Electrical Measuring and Protective Apparatus

Main Office:
2140 Woolworth Bldg.,
NEW YORK



Works:
Bethlehem,
Penna.

Offices in Principal Cities in United States and Canada
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It dispensed also with a helper to carry the equipment for the tester. It dispensed likewise with road car, side car or other means of transporting the old style bond testing equipment.

And, in addition, it is many times more accurate than the old device. If you are interested in bond testers fill in the coupon. We will send Bulletin G-200 giving all the details. Mail the coupon today.

Roller-Smith Co.,
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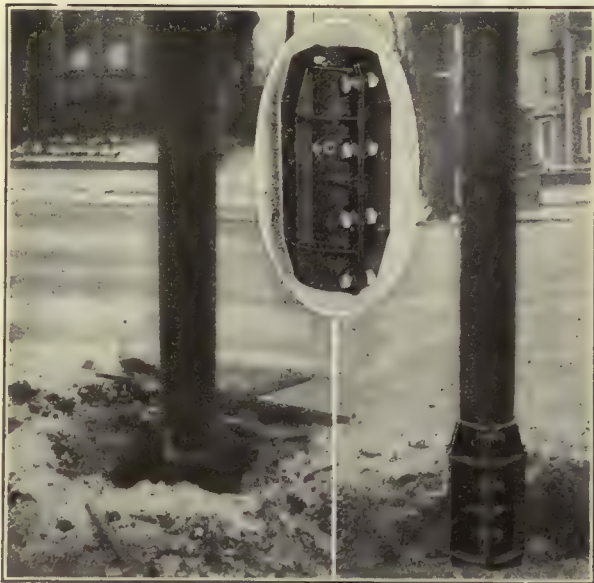
Please send new Bulletin G-200.

Name.....

Company.....

City.....State.....

Position.....



Clark-Williams Tubular Iron Pole Reinforcing and Extension Clamps

Years can be added to the life of any iron pole which has become corroded at the ground level with our REINFORCING CLAMPS, or added height may be obtained by using the EXTENSION CLAMPS.

ALSO MOUNTS FOR WOOD POLES.

Ask for quotations on your requirements

The Clark-Williams Engr. Co.
886 Main St., Bridgeport, Conn.

Griffin Wheel Company

410 North Michigan Ave.
Chicago, Ill.

GRIFFIN F. C. S. WHEELS

**For Street and Interurban
Railways**

FOUNDRIES:

Chicago
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Boston
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St. Paul
Los Angeles
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Cold Dinners

for your passengers?

Not if you use

AJAX

BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company

Established 1880

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CHICAGO

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Strombos Signals for Railway Service

A pleasing sound of tremendous volume is emitted from the powerful Strombos Signal which is admirably suited for railway service. Day in, day out, it broadcasts a warning of approaching danger and promotes safe and efficient railway operation.

The Strombos Signal operates on an air pressure of 10 lbs. and over and is controlled by lever valve and cord. It uses only 1/10 the volume of air required by a whistle. It has no moving parts which might fail in the emergency.

Write us for more complete data.

**AMERICAN STROMBOS CO.,
INCORPORATED**

18th & Market Sts., Philadelphia, Pa.



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Three Times as Efficient!

PHOENIX Electric Refrigerator Cars have proved to be at least three times as efficient as standard ice refrigerator cars in delivering perishable products on identical runs. They are continuously in active carrying service, no time being required for pre-cooling or re-icing as with ice refrigerator cars.

Continuous operation is only one of the several distinct advantages afforded by Phoenix Electric Refrigerator Cars.

Icing stations, with consequent organization to care for them, are rendered entirely unnecessary.

Operatives require no special skill to care for these cars as they are automatic

in operation. The apparatus is positive in action and can not easily get out of order.

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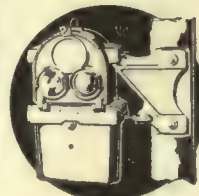
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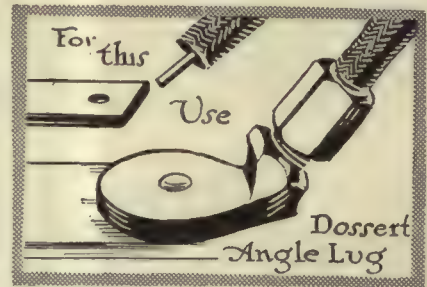
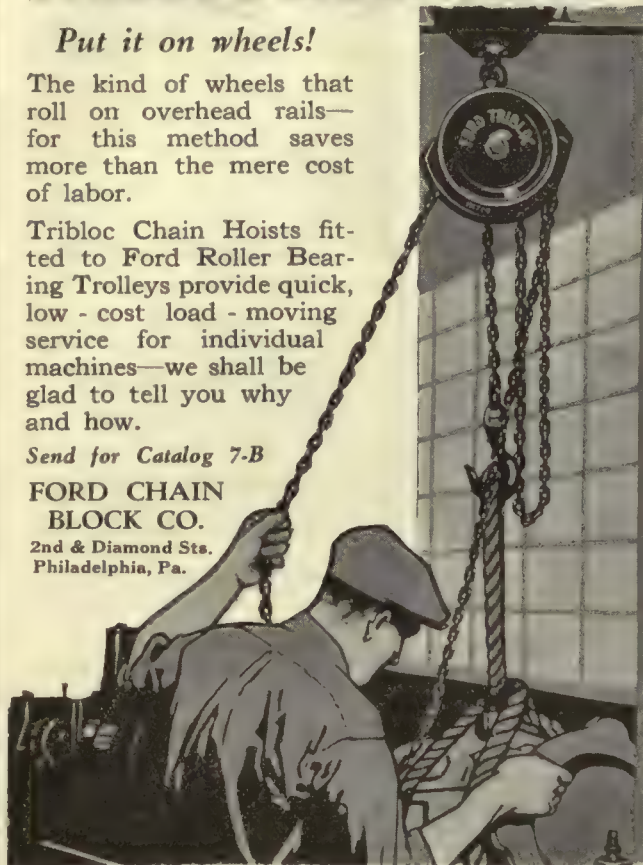
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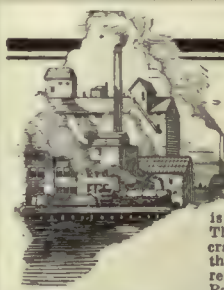
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Established 1827



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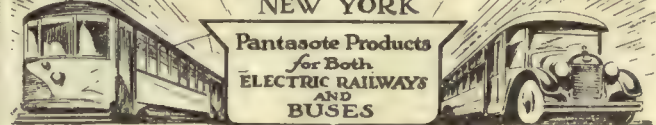
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National Railway Appliance Co.

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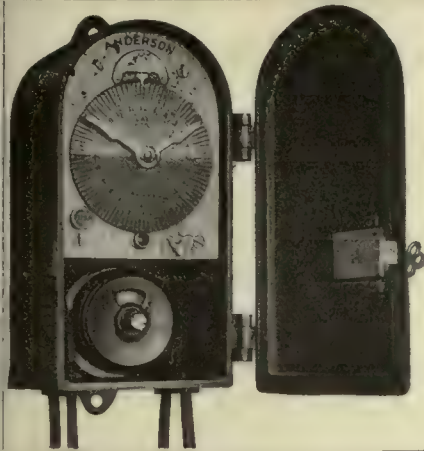
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Automatic
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The longevity of our wheels is not due to
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The bearing improves with use and many
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Better Quality Seats
For Cars and Buses

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E R J

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POSITIONS WANTED? Did you read the ad alongside of this? Same thing applies in your case. A Searchlight ad will introduce you to responsible officials and executives. Address "SEARCHLIGHT," Tenth Ave. at 36th St., New York City.

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Brill Built

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TODAY you can turn them over at a fair price. Tomorrow they will be—JUNK. Is it not the better part of good horse-sense to dispose of them NOW?

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ELECTRIC RAILWAY JOURNAL

Tenth Ave. at 36th St., New York, N. Y.

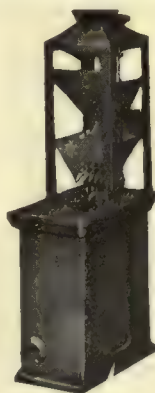
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Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.

Compressors, Air, Portable
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Ingersoll-Rand Co.
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Elec. Corp.

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Elec. Corp.

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American Steel & Wire Co.
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International Register Co.
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Silver Lake Co.

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Elec. Service Supplies Co.
Samson Cordage Works
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Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

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Electric Service Supplies Co.

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International Steel Tie Co.

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Wm. Wharton Jr. & Co., Inc.

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Wm. Wharton, Jr. & Co., Inc.

Crossing Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton Jr. & Co., Inc.

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Crossings, Trolley
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Westinghouse E. & M. Co.

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Edwards Co., Inc., The O. M.
Morton Mfg. Co.
Pantastote Co., Inc.

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Elec. Equipment Co.
Salzberg Co., Inc., H. E.

Derailing Devices (See also Track Work)

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Ramapo Ajax Corp.

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Columbia Machine Wks.
Elec. Service Supplies Co.

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Wish-Servico, P. Edward

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Consolidated Car Heating Co.
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Safety Car Devices Co.

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Edwards Co., Inc., The O. M.
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Hale-Kilburn Co.

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Safety Car Devices Co.

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American Steel & Wire Co.
Roebbling's Sons Co., John A.
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Railway Trackwork Co.

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Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
Kelly Cooke & Co.
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood, Inc.
Stone & Webster
White Eng. Corp., The J. G.

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Electric Service Sup. Co.

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Carnegie Steel Co.
Standard Steel Works

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Bethlehem Steel Co.
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Wm. Wharton Jr. & Co., Inc.

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Westinghouse E. & M. Co.

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Elec. Corp.

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Johns-Pratt Co.

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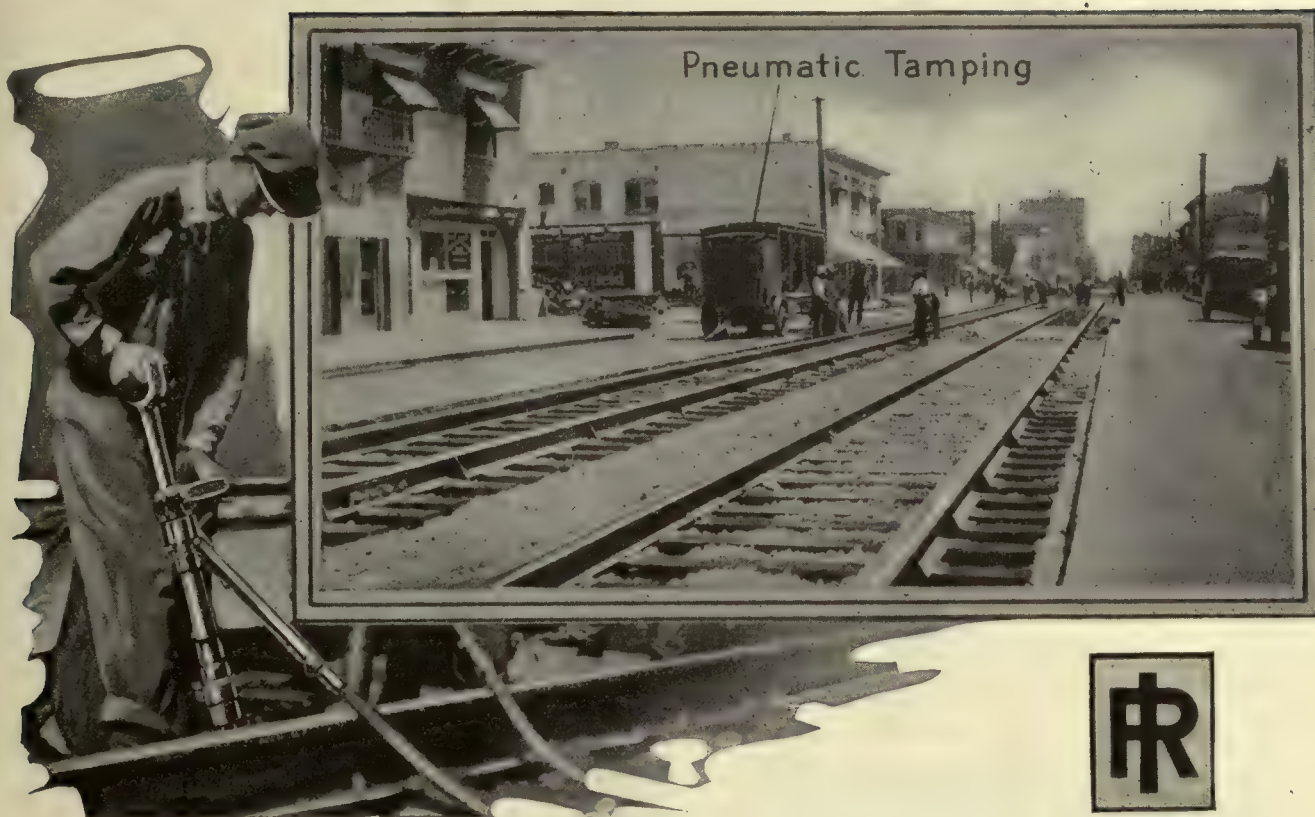
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(Continued on Page 70)



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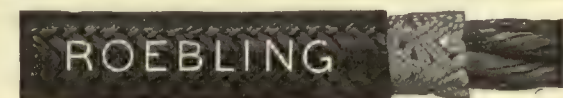
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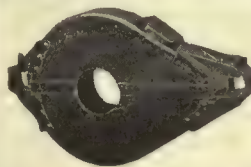
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GENERAL ELECTRIC

ELECTRIC RAILWAY JOURNAL

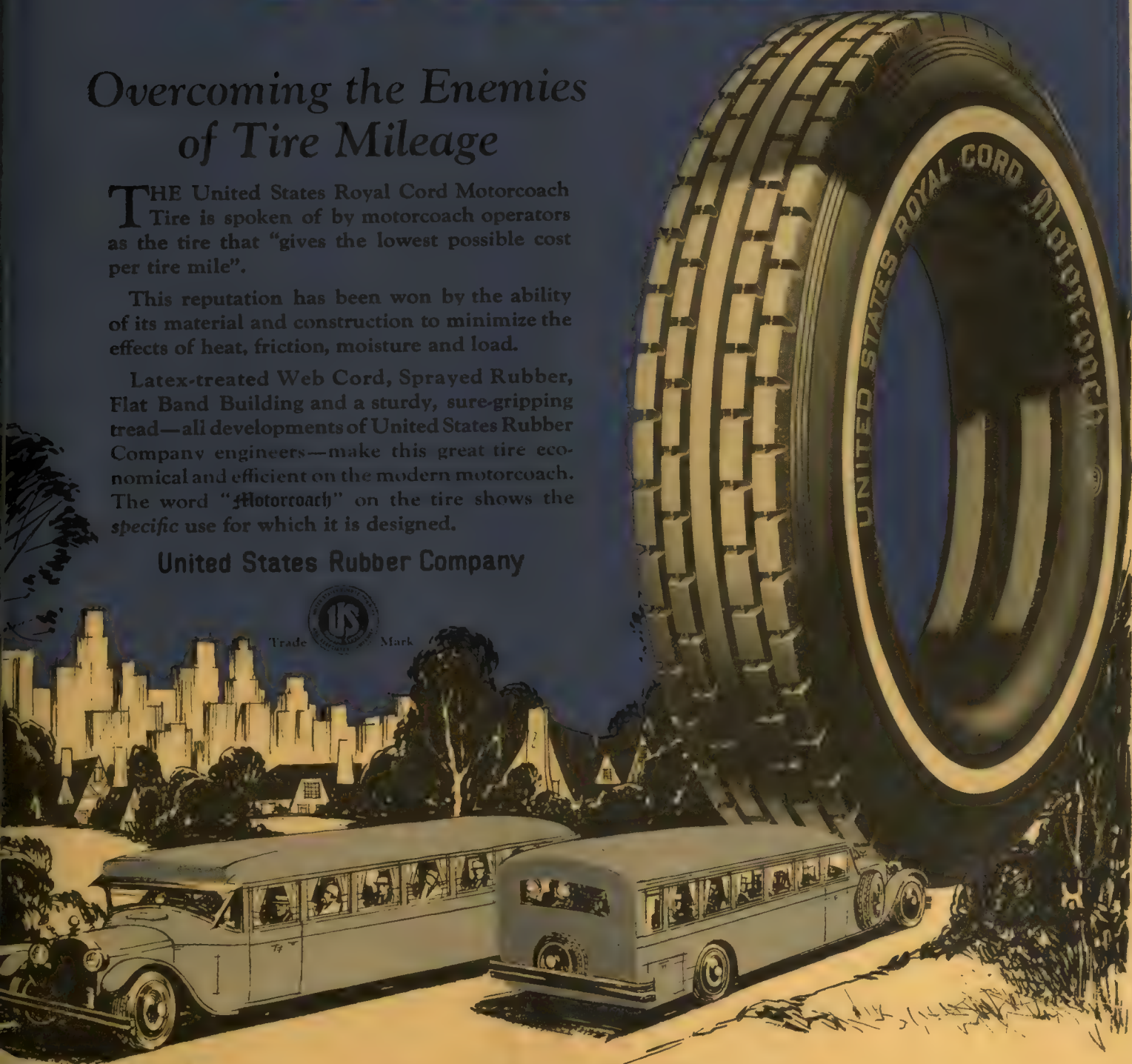
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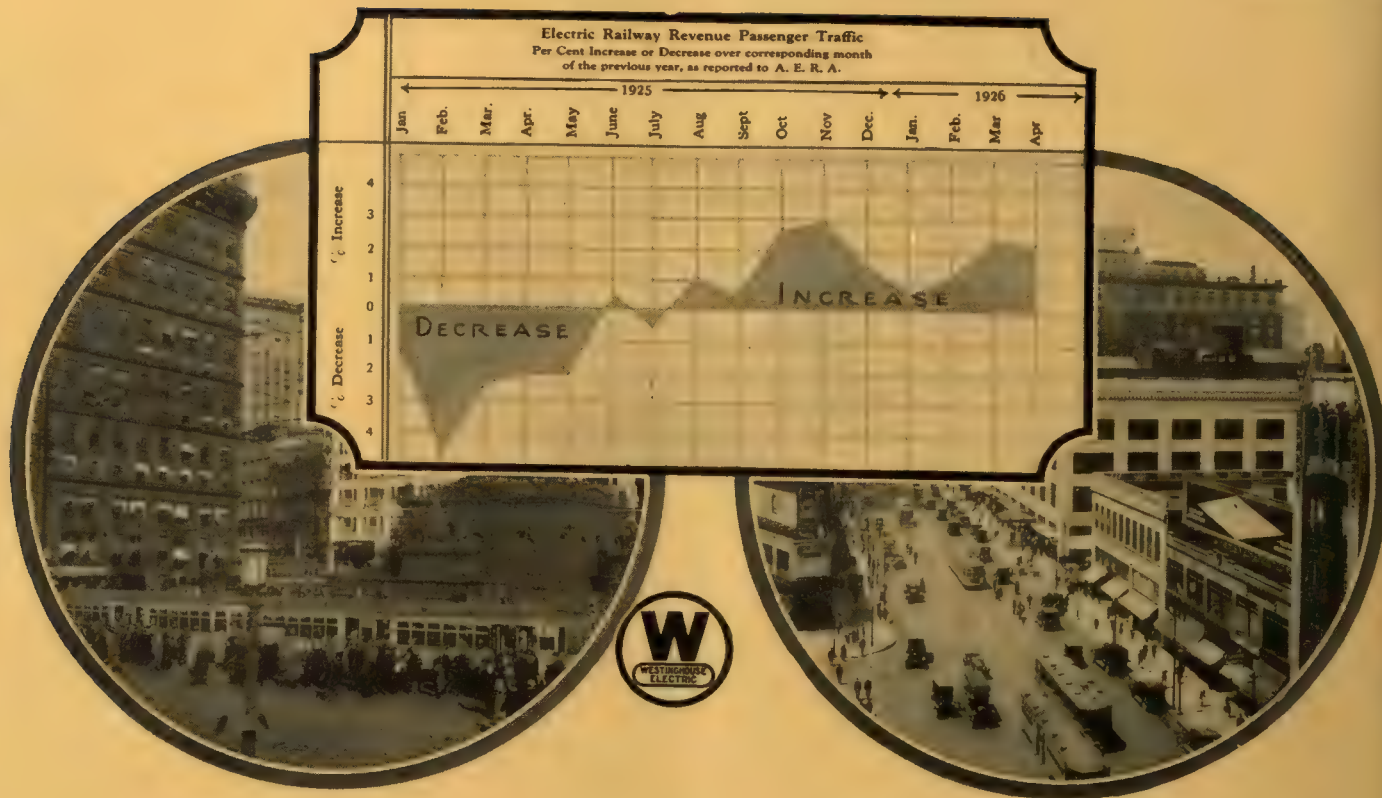
Latex-treated Web Cord, Sprayed Rubber, Flat Band Building and a sturdy, sure-gripping tread—all developments of United States Rubber Company engineers—make this great tire economical and efficient on the modern motorcoach. The word "Motorcoach" on the tire shows the specific use for which it is designed.

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1926

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EVERY year some seven million tons of paper are produced in the United States and Canada for printing and publishing purposes. This is sufficient to print the sum total of human knowledge in large type many times over.

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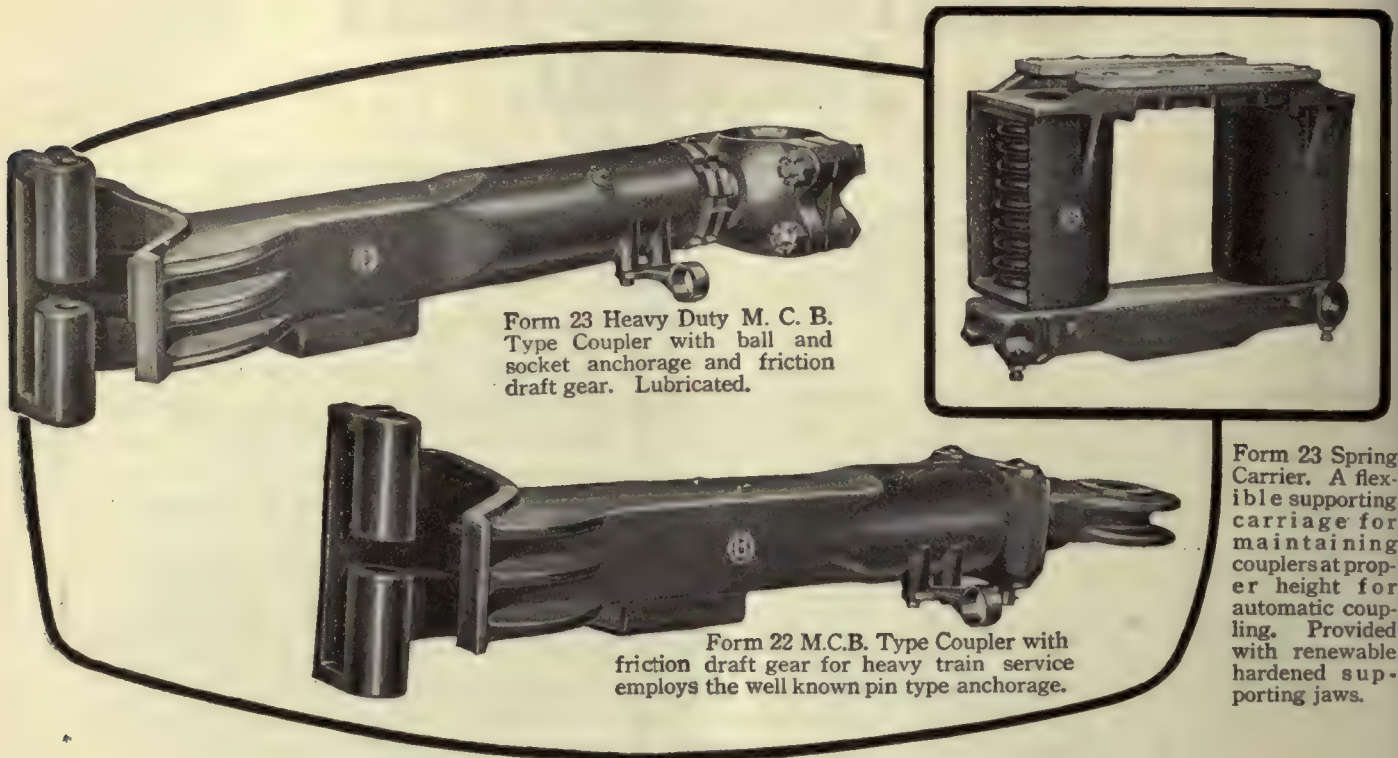
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order of economy in
the cost of current
collection—*



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The Tampa Electric Company has recently put into service seven modern light weight cars, which are equipped with Westinghouse Variable Load Brakes.

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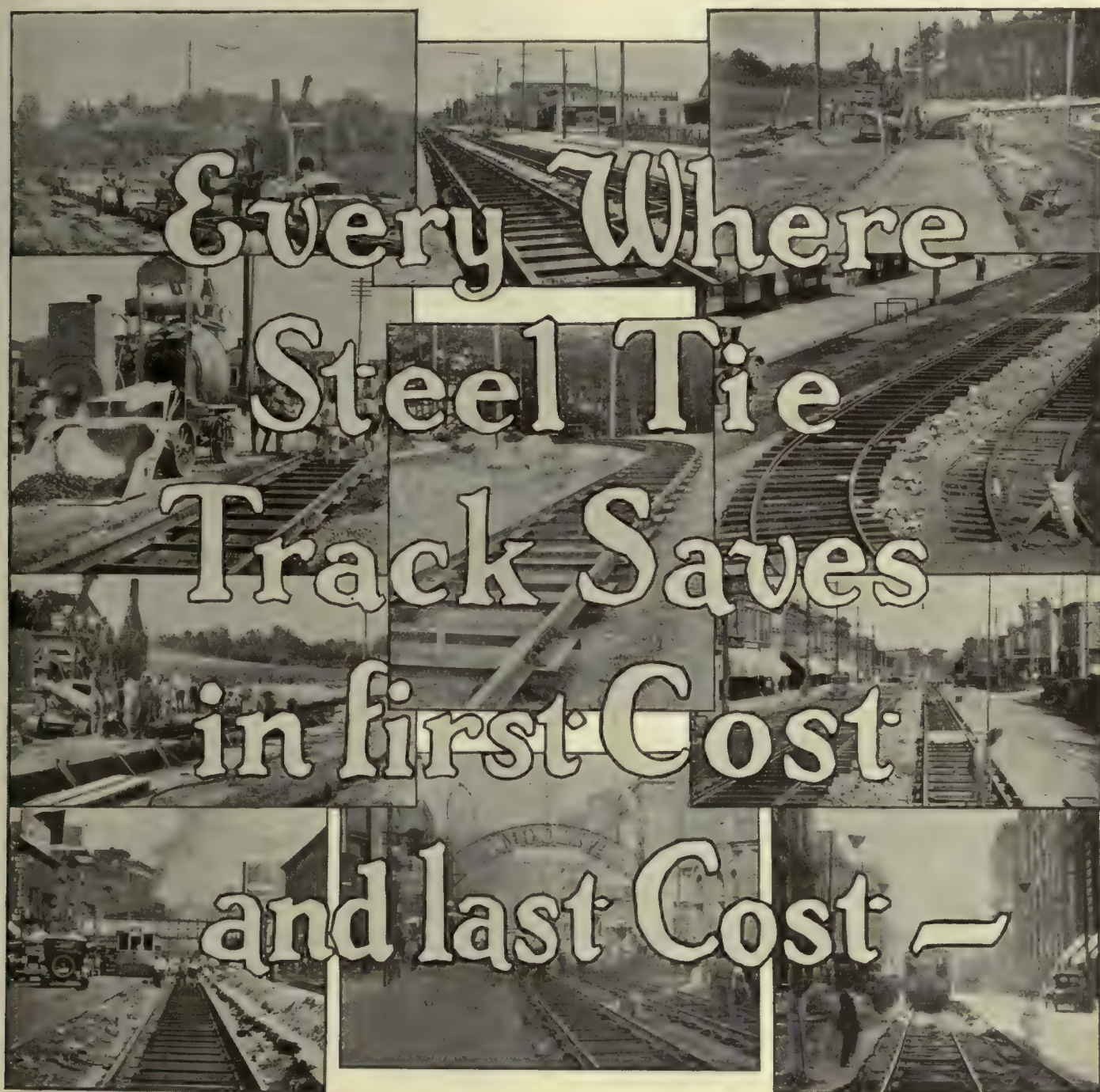


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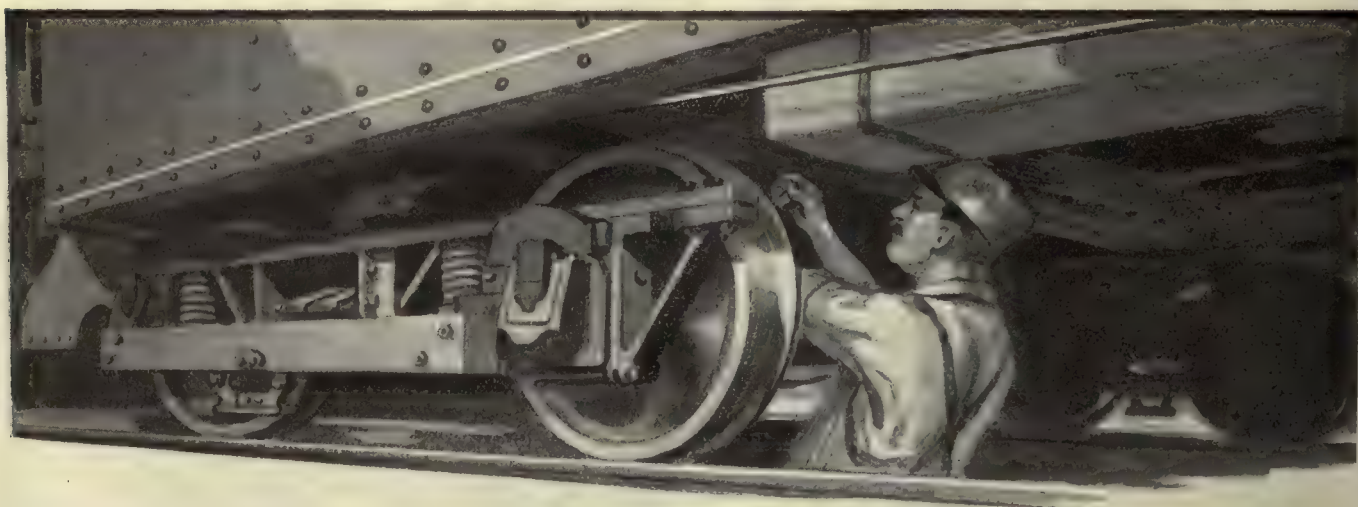


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in first Cost
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in mind ————

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Publicity
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Maintenance*

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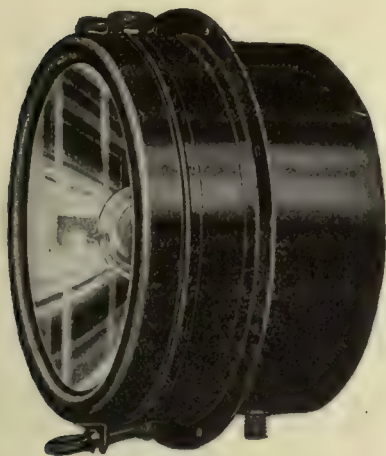
This results in greater safety for both passengers and cars—which increases revenue and decreases maintenance.

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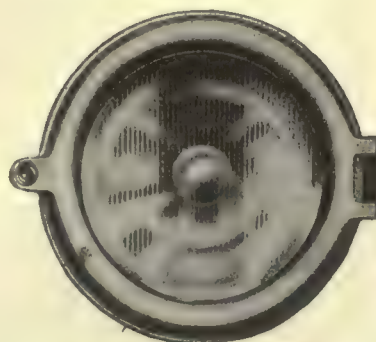
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Determines Dividends!



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E. A. Thornwell, Candler Bldg., Atlanta

Frank F. Bodler, 903 Monadnock Bldg.,
San Francisco
Chris Eccles, 320 S. San Pedro St., Los Angeles
T. C. Coleman & Son, Starks Bldg., Louisville

W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
W. D. Jenkins, Carter Bldg., Houston, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS



Co-ordinated Service





Yellow Coaches and of service for TH

YELLOW COACHES are continually solving the varied problems of co-ordinated transportation for an ever-growing number of street railway companies.

They are solving these problems daily by rendering steady dependable service that assures the greatest number of hours on the road for the least money. Their flexibility of service enables the company operating them to profitably back up its cars and extend its operations along new lines of fruitful revenue.

For example: take the case of the Connecticut Company, where 48 Yellow Coaches are operating over approximately 100 miles of routes,

varying in length from 35.2 miles to 2.1.

Motor coach service, as rendered by the Connecticut Company, is divided into three classifications.

First—service given to new districts which have grown up at considerable distances from existing car lines.

Second—service over certain routes where street car operation has been discontinued.

Third—service which connects important terminal population by bus routes shorter than those of cars.

As practiced by the Connecticut Company, co-ordinated service means that the routes of the car and



meeting varying types **CONNECTICUT CO.—**

bus lines have been laid out so that all sections of the city of New Haven are provided with adequate transportation facilities.

Yellow Coaches fit into this plan of co-ordination—48 of them; a fleet which has grown rapidly since the first Yellow Coach was purchased in January, 1924. Two months later three more were added and others purchased frequently and today, in number, Yellow Coaches predominate in the service of the Connecticut Company.

Called upon to meet very heavy short peaks where for a few hours equipment must be increased as high as 100 per cent, stopping and

starting constantly in busy congested streets, swinging along over highways and connecting small towns with a net-work of service, Yellow Coaches are meeting all demands at a cost of operation which has built up continually the number of Yellow Coaches operated over the routes.

Motor coach service is given wholeheartedly by the Connecticut Company, therefore the success of the operations. And in no small measure is economy secured by the wholehearted performance of the Connecticut's fleet of Yellows—performance that keeps them on the road where they may earn.

Another meaning of **CO-ORDINATED SERVICE**

THE vast operating experience of Yellow Coach combined with the research facilities of General Motors offers a co-ordinated service that stands ready to point out the logical and most economical solution to *your* transportation problems.

Placed at your service are all the united resources of these two great institutions, each contributing to make your operation profitable. Manufacturing facilities, research, financial stability, transportation experience; these are some of the advantages which this co-ordinated service means.

Yellow Coach plus General Motors is in business to stay. Danger of "orphan equipment" is eliminated. Initial investment is protected.

YELLOW TRUCK & COACH MANUFACTURING COMPANY

SUBSIDIARY GENERAL MOTORS CORPORATION

5801 WEST DICKENS AVENUE, CHICAGO, ILL.



WELCOME

A gate or door, promptly opened to admit you, is the surest sign of hospitality and welcome. Passengers do not have to wait or bang upon the doors of cars equipped with National Pneumatic Door and Step Controlling Mechanisms. Doors open promptly, courteously and quickly and close in the same way when once the passengers are out or safe inside.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

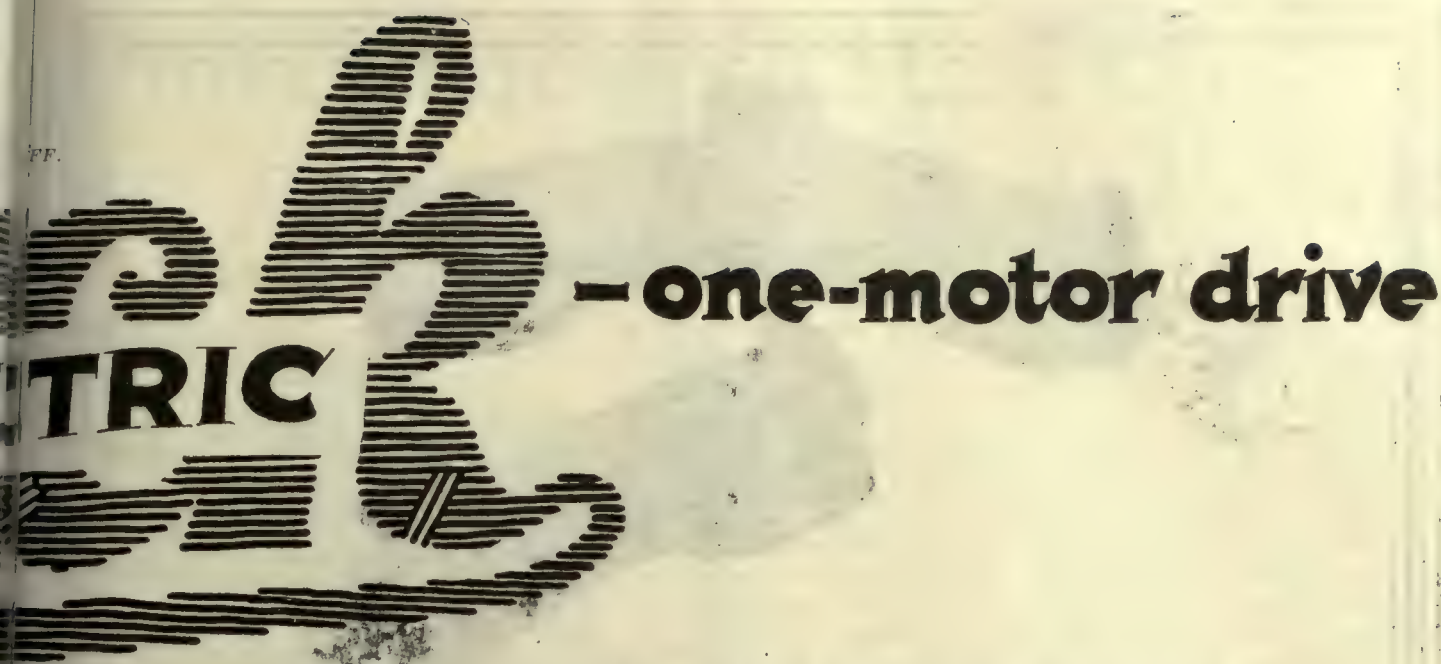
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The first bus was a Mack
the first Mack was a bus



Built to Operate—Not to prove theories

One-motor drive, battery excitation, automatic field resistance control, simplicity and accessibility in the Mack Gas-Electric bus represent the results of design from the operator's standpoint, just as with the other features of exclusive superiority which characterize Mack mechanical-drive bus. Mack buses are designed for maximum satisfaction, economy and dependability in operation—not to prove arbitrary engineering theories.

A car with two engines was once marketed in this country. Its duplicate power plants were supposed to give reserve power,

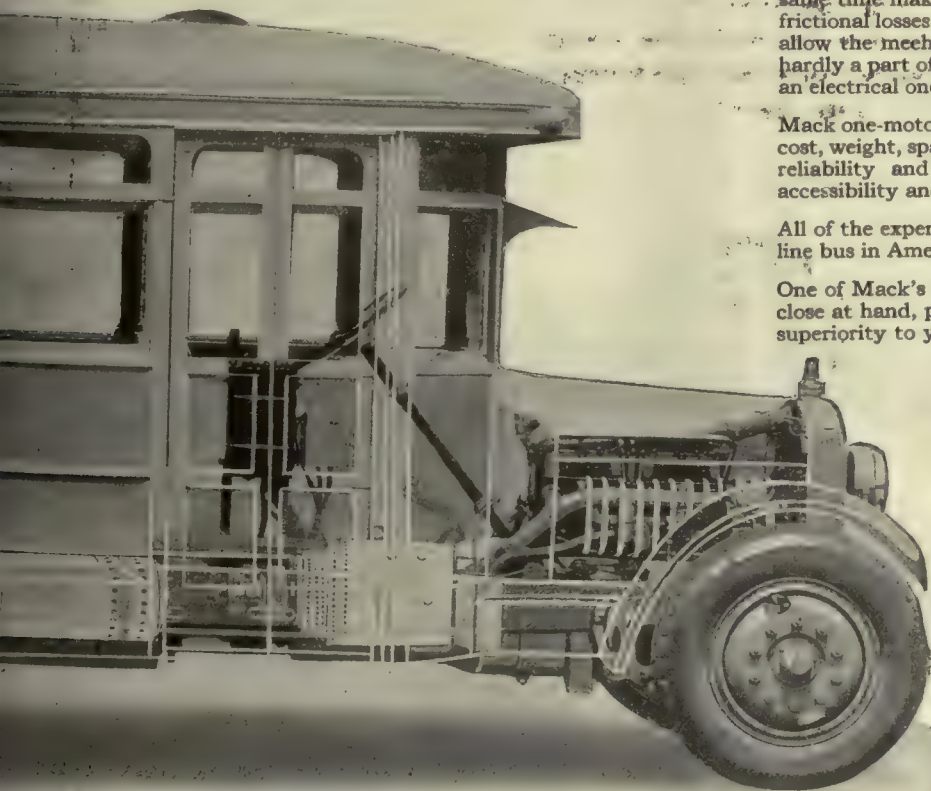
reliability and to economize on fuel in ordinary running with one engine shut down. However, its duplicate power plants weighed more, cost more, used more fuel and required more maintenance than a single engine such as used today.

In the development of the gas-electric bus in this country, two-motor drive has been used by all but Mack. Two-motor drive is supposed to permit a smaller motor; smaller drive shafts, universal joints and driving gears and to eliminate the differential. However, the duplication of small parts actually increases weight, electrical losses, cost and space occupied by the parts, while at the same time making for higher maintenance, greater electrical and frictional losses and serious interference with accessibility. It does allow the mechanical differential to be dispensed with, although hardly a part of a modern bus gives less difficulty, and substitutes an electrical one.

Mack one-motor drive follows rational, commonsense lines, saving cost, weight, space, complication and yielding maximum efficiency, reliability and performance, preserving high road clearance, accessibility and a low, flat floor in the bus.

All of the experience of the organization that built the first gasoline bus in America contributes to this eminently practical result.

One of Mack's one hundred and seven direct factory branches is close at hand, prepared to demonstrate these and other points of superiority to your own satisfaction.



MACK TRUCKS, INC.

INTERNATIONAL MOTOR COMPANY

25 Broadway, New York City

One hundred and seven direct MACK factory branches operate under the titles of "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION," "MACK MOTOR TRUCK COMPANY," or "MACK TRUCKS OF CANADA, Ltd."

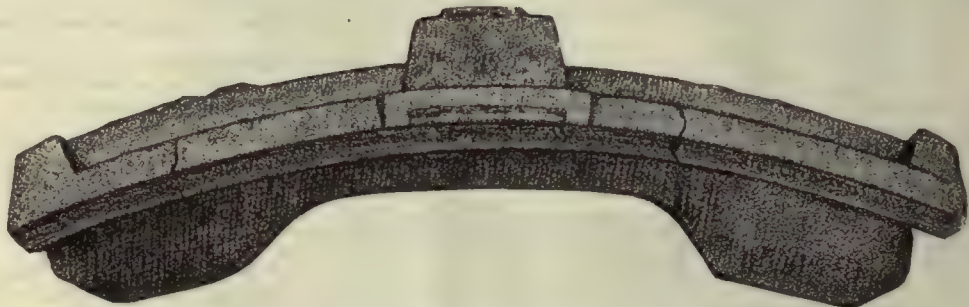
The **Mack** *Bus*



When is a brake shoe worn out?

A CRACKED brake shoe, when held properly together by the steel reinforcement, has greater braking efficiency and durability because it fits the wheel better. A partially worn American Brake Shoe, therefore, is often better than new and is good for service until worn down to the mark which indicates its wearing limit. You continue tires on a motor car until the fabric shows through the tread. Why discard a brake shoe which has not worked for you to the full limit of its wear?

"BEST BY TEST"



THE AMERICAN BRAKE SHOE AND FOUNDRY COMPANY

30 CHURCH ST., NEW YORK
332 S. MICH. AVE., CHICAGO

Timken-Equipped Mack Cars on the N. Y., N. H. & H. R. R.

Mack and the New Haven are among the pioneer makers and users of gasoline rail cars. Together they have tested Timken Tapered Roller Bearings in every phase of gas car design and operation, for hundreds of thousands of miles.

The characteristics which Timkens provide have been found an essential contribution to fast, regular, attractive, profitable service. With Timkens there is none of the waste of excess friction in starting, running and rolling. Lubrication troubles are at an end—lubrication charges become negligible. Traffic interruptions are nil, so far as Timken Bearings are concerned, because there is highest endurance in the extreme load area of Timken tapered design, Timken *POSITIVELY ALIGNED ROLLS*, and Timken-made steel. Thus shafts, gear, axles and wheels are held permanently in line, promoting quiet, comfort and surety.

In every way Timkens are helping rail cars to make money where nothing else will. This is certified by most of the great car manufacturers and users, like Mack and the New Haven.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

Technical information regarding bearing sizes and their mountings can be secured from the Timken Roller Bearing Service & Sales Company's Branches located in the following cities: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, Newark, New York, Omaha, Philadelphia, Pittsburgh, Richmond, St. Louis, San Francisco, Seattle, Toronto, Winnipeg



TIMKEN *Tapered Roller* BEARINGS



Safeguard Against

Decay, insects, white ants, woodpeckers, grass fires and storm damage. Eliminate these causes of pole failure and protect service and investments with *International Creosoted Pine Poles*.

Their durability means long life and low maintenance—their permanent strength insures safety and reliable service.

Use them for your outside plants.

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Pine Poles near Indianapolis, Ind.,
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International Pressure Creosoted Yellow Pine Poles



Gary's New Lightweight Cars *replace heavy type equipment*



The Gary Railway appreciates the power of attractive cars to build up riding, as evidenced by the new cars just placed in service. The new, one-man, two-man cars replace much heavier two-man cars. Comfortable plush-upholstered seats for forty-six passengers, linoleum floor covering, special lighting and vestibule cabinets covering the air piping, all combine to present an interior invitingly attractive and decidedly comfortable for long rides. Cummings No. 62 trucks are used, with four 35 h.p. motors. The entire weight of car is 37,000 pounds.

CUMMINGS CAR AND COACH COMPANY

Successor to McGuire Cummings Mfg. Co.

111 W. Monroe Street

Chicago

Light Weight City and Interurban Cars

Gas-Electric Motor Coaches



Again service tests decide: "G-E Motors and Control shall be used"

More articulated cars, 67 of them, are to be G-E equipped. This number of triple units was recently ordered for the B. M. T. Rapid Transit Lines. They will be duplicates of the two articulated cars, G-E equipped, which the company has had in trial service several months.



General Electric has made many contributions to the progress of mass transportation in New York City. The purchase of G-E Car Equipment for these articulated units is another expression of confidence on the part of operating engineers who are solving the complex transportation problems in this metropolitan district.

Each three-unit car will carry a complete G-E 4-motor equipment, with Duplex PC Control specially adapted to the service of this modern rolling stock. All of the 268 motors will be type GE-282, characterized by the same sturdy qualities possessed by the GE-248 Motor of which there are 1800 in operation on the B.M.T. Lines.

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GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, Editor

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Number 4

Strike on Interborough Subway Collapses

TO THOSE fully acquainted with the facts of the strike of the motormen and switchmen of the Interborough Rapid Transit Company, New York, the collapse of that ill-advised suspension of work was inevitable. And it came on Thursday night. As this is being written the depleted forces of the strikers are bidding again individually for permission to be put back to work. This is the condition set by the company for re-employment. The bravado of the last few days on the part of the men fooled no one. Each succeeding day there came from the company a statement showing the increase in the extent of the service—a statement that the public saw reinforced by a similar one from the Transit Commission. Then a few days ago came the last straw. The company announced that its extensions into Brooklyn, on which no attempt had previously been made to furnish service during the strike, would resume. That presaged the end.

It was inevitable that there should be a lot of complaining on the part of the men. The leaders of the strikers could hardly appear publicly to accept the onus of their own acts. And so, as is usually the case, they began to bellyache. They said the general press reports of the strike were misleading, that the presentation of their side was distorted and that they were lied about. They said there had been a lot of trickery on the part of the company. This, of course, is the doctrine of despair. It is true that in its early aspects the strike appeared to be serious enough, but the strike, and particularly the strikers, got columns more of space daily than either one or the other deserved. If the men were given short shrift in the editorials it was only because that was what they deserved. As for trickery, the charge lies more against the union than it does against the company. Is it trickery on the part of a company to sue employees who have actually ignored the terms of a contractual relationship?

Great credit is due to the Interborough officials. They had to withstand many violent verbal onslaughts which linked the strike with what was conjured up to be a deep laid drive for an increase in fare. To this scant attention was paid. The officials never let themselves be diverted from the work of replacing men who went out. They did a smart thing in shutting down the lines to Brooklyn, the patronage of which could easily be diverted to the lines of other companies, and concentrating on the restoration of service on the lines in Manhattan and the Bronx. There was considerable comment adverse to the company's suit against the employees. One of the main criticisms was that the company, knowing it had the men licked, stood to lose public favor by threatening to sequester the property of

its men. This criticism, of course, turns on a fine point. Some of the strictures against this move are, perhaps, not without merit, considered solely from the standpoint of public relations, but a public utility is under compulsion to give a service that is continuous and a suit against its employees is certainly justified if that is the only way in which the obligation of the men to the company and the public can be brought home to them. It would have been altruistic on the part of the company not to have made this move, but altruism is not, *per se*, desirable. After all is said and done, it is unfortunate that it was within the power of this band of recalcitrants, small by comparison with the total number of employees, to cause the company the loss it did, to try to confuse the issue with politics, and to put the public to no small degree of inconvenience. The controversy was not sought by the Interborough. That company, confronted as it was with the issue of capitulation to this band of recalcitrants or of replacing them, refused to accept the domination sought to be imposed—a refusal that was not only in its best interests but in the last analysis was in the best interests of the riding public of New York.

Cleveland Will Produce a Real Car Exhibit

NEVER in the history of electric railway conventions have conditions for exhibiting appeared more auspicious than this year. Never has a convention been held in a more central location with respect to the industry than this in Cleveland. And never has such a situation been gripped by a more able body than the local convention committee centering around the executives of the Cleveland Railway. Nearly 110,000 sq.ft. of space is assigned. This will be housed in excellent quarters requiring an extension to the new building of 180 ft. The planning of the show is well under way. The exhibit committee met last week and made the final assignment of space, which will be in five distinctive locations.

Not enough is it, apparently, that the space sold inside the building is well above that of any other year, but the local convention committee wants this particular exhibit to reflect the awakening of the industry from the coma in which it has been for several years. Cars are wanted for the open-air tracks to make a real exhibit. If present and prospective plans develop the people of Cleveland, if not many of the delegates, will receive a real surprise when they witness the spectacle of modern cars which will hold a central position in the 1926 convention. Neatly planted between the two buildings will be fourteen tracks, each capable of holding at least five full-sized cars. The illustration of the convention layout reproduced elsewhere is

not an idle view but the definite aim of the men producing the exhibit.

Now, if ever, is the time to break precedent and send the physical representation of every latest conception of modern rail transportation. So far the prospective exhibitions are about equally divided between manufacturers and operators. Exhibits on the part of operators are especially commendable. They have nothing to sell except transportation to their local communities. The operators realize, however, that it is essential to show to electric railway men and the public generally that they are alive to their opportunities and have radically improved their facilities. Here is a chance to deal a deathblow to popular fallacy that the railways are decadent.

The exhibit will be open to the public at least one day and evening; in fact, the open-air exhibit will be in view of thousands of Clevelanders each day. Besides this it is planned to have a parade on certain of the city streets that will attract wide interest throughout the nation.

Nor will buses lose ground, as manufacturers of this class of equipment are planning a visual representation of their share in the production of modern transportation throughout the year. There will always be a spirit of rivalry between these dissimilar types of vehicles, just as between various manufacturers of similar equipment. It is more evident than ever before that proponents of each type of vehicle share one common viewpoint, that of providing better transportation. It remains with the operators, working in conjunction with the manufacturers, to place common carrier transportation among those industries that occupy the front ranks today.

It can be done—and the prediction is that Cleveland will prove so.

South Shore Road Rehabilitation and Financing Attract Attention

COMPLETION of the first unit in the rehabilitation program of the Chicago, South Shore & South Bend Railroad and of the public offering of \$1,060,000 of equipment trust certificates secured by rolling stock of that company were announced almost simultaneously. Either of these events would have been sufficient to attract attention in electric railway circles, but the two of them coming almost together certainly emphasize the work that has been done on the road and testify to the appreciation by the bankers of the strong position in which the company has been placed.

So far as the conditions are concerned that surround the terms under which the bonds are secured there is nothing particularly new about them, but the basis upon which it has been possible for the company to do its financing is significant. The equipment trust certificates run for ten years. They are priced to return the investor from $4\frac{1}{2}$ to $5\frac{1}{2}$ per cent. In total amount they represent about 80 per cent of the cost of the new equipment. To electric railway men the issue is significant in that it may be said to represent terms under which money can be borrowed when bankers are assured, as they were in this case, that the rehabilitation of a road is thorough and that the line will be developed intensively.

It may seem trite to say so, but it would appear that

this is another case of virtue being its own reward. The Insulls, by whom the road is now owned, have back of them the record made with the Chicago, North Shore & Milwaukee Railroad and their other properties, but they have no corner on the market for the intelligent application of selling methods. Others have done almost equally as well as they have done.

In the news of the events now recorded there are lessons for others not only in the speed of completion of the rehabilitation of this road but in the terms of the financing and the type of equipment that is being placed in service. Where others failed the Insulls saw an opportunity to re-establish this road operating through the so-called steel section of northern Indiana and they set about it with a vim and on a scale that some at first were inclined to regard as stupendous. An undertaking of this kind, however, was not new to them. It was not the first time they had spent large sums of money on projects others regarded as hopeless. They had learned from experience that, other things being equal, you get out of a thing only what you put into it. And they put into the Chicago, South Shore & South Bend Railroad not only money but enthusiasm intelligently directed.

How to Care for the Paving Charge

INJUSTICE of the paving charge borne by most street railways is generally admitted. The difficulty in getting rid of it is to find some other place to put the burden. In most municipalities the taxes are now very high, and any increase in assessments is reflected almost immediately in larger appropriations for schools, paving which the city has to do, or in other ways which the city has to spend its money. No matter how just theoretically it would be to relieve the electric railway company from its paving obligations, no great amount of enthusiasm can be expected from the citizens on such a plan if it means that the paving cost, now borne by the railways, is placed in the city budget.

Such relief may come in special cases, as where an old franchise expired and a new one is negotiated. But a much more popular method in most cases would be to devise some means by which the paving expense, when lifted from the railway company, would be placed on the shoulders of some one other than the citizens of the municipalities in which the railway operates.

If the city is not to assume this expense, the only other available place to put the burden is on the state, and fortunately a logical argument can be given that the state should defray this expense. This was developed in an address delivered at the League of Boroughs Convention at Stroudsburg, Pa., on June 23, 1926, by A. W. Robertson, president of the Philadelphia Company of Pittsburgh, and for many years its general attorney. He pointed out that last year in Pennsylvania the state collected \$4,657,752 from the gasoline tax alone, and that the auto license fees in the state were six times as much, a grand total of \$26,447,943.77. These fees and taxes were paid in very large part by citizens of municipalities who were also street car riders, yet practically all of it is being spent to improve highways that are wholly outside the limits of the municipalities.

The speaker did not mean to imply that the highways outside of the cities are not used to a considerable

extent by city dwellers. It is reasonable to believe, however, that a very much larger proportion of the revenue of the state from these sources comes from dwellers in cities than is represented by their proportionate use of the state highways. At any rate, the electric car rider, *per se*, gets no use at all from this large revenue and would be very much better off if the sums now spent on paving by the electric railway which he patronizes should be expended on new cars, better track or more service.

In other words, it is Mr. Robertson's idea that the dwellers in cities, individually and collectively, would be very much better off if the paving burden were taken from the electric railways and placed on the state, its cost being defrayed out of the general highway appropriation, as it should be.

The plan certainly seems logical, and it is the hope that its reasonableness will appeal to the general public.

The Mayor's Chickens May Come Home to Roost

IN THE feverish heat of an election struggle last year Mayor F. X. Schwab of Buffalo, New York, had the temerity to commit himself to a platform of bus operation on the basis of a 5-cent fare. Perhaps he was sincere in his belief that such a Twentieth Century miracle could be negotiated. At any rate, the plea was successful and he found himself in the course of time duly re-elected. For a time all was quiet. Then, certain newspapers began unfeelingly to remind the Mayor of his campaign promises. Here was the International Railway operating buses on a 10-cent fare and seeking permission to make numerous additions to the service. Where was the relief promised by the Mayor?

Alas! His Honor was in a quandary. He began to develop a temperament. He periodically fulminated against the International Railway and its flat refusal to consider a reduction in fares. He threatened repeatedly to declare a transportation emergency within the city's boundary. Then he departed for Europe.

Heralding his return to this country, not long ago, came the announcement that the city would endeavor to put the local transit company in its place by establishing a rival bus operation at a lower fare. But mysteriously the 5-cent fare had departed. The Mayor by a stroke of genius conceived the idea of delegating the operation of the city's vehicles to the police department. A unique method, surely, for cutting down the overhead.

Now, one may ride in buses of the city of Buffalo at an 8-cent fare, the same rate as the cash fare charged on the street cars, but with no transfer privileges. Furthermore, timid souls may be reassured by observing the minions of the law attired in full regalia and operating the buses so impressively.

But oddly enough the International Railway seems not overly worried by this punitive action. Some clue to this indifference may perhaps be gathered from the circumstance that the total revenues from the first day's operation of the city's first bus line took in receipts of but \$35—not enough to pay for the gasoline consumed

by the five buses. Fortunate, indeed, that the "operators" need not be paid from the receipts.

No apparent hesitancy has been felt by the Mayor and his followers on the City Council in throwing good money after that already sunk in the venture. In the meantime, the International Railway appears to be biding its time while extensive operating plans are being laid and more buses ordered that the city will ultimately have on its hands.

No Battle Was Ever Won by a Defensive Position

PEGASUS, the winged horse of ancient lore, has found a new pasture. He now crops daintily at the greenery which is found within the environs of Philadelphia. Twice daily he wafts himself lightly over to the nation's capital. But when he goes there is upon his neck a steady rein and there is astride his back a group of mere humans, willing now to intrust themselves to the gallant old steed who has long since left behind him the friskiness of coltblood. The present-day manifestation of this mythical beast, while lacking the temperamental uncertainties of his immortal forebear, still possesses all of the grace and beauty which the gods are said to have bestowed upon their favored steed.

Doubtless it was something of a shock to those professional mourners who have been for years descanting upon the hopeless lethargy that has fallen upon the electric railway industry when one of its representatives came forward with a revolutionary concept for public transportation. Today it is more than a concept—it is an established fact. Every day passengers are being carried between Washington and Philadelphia in the luxurious planes of the Philadelphia Rapid Transit Company. And this transportation is being rendered at a price which is within the pocketbook of the average American business man.

It quite behooves one to pause for a moment and speculate upon the possibilities which are opened up by this move. The primary object in establishing the service was not to make money, although with the degree of popularity which is being attained that seems bound to follow. First and foremost the undertaking serves to keep the railway before the eyes of the people as one of the most progressive factors in community life.

The bugaboo which haunts so many electric railways today is ultra-conservatism. The effectiveness of any new idea lies in striking while the iron is hot. To wait until some other company has given the test of years to a suggested plan is to lose 90 per cent of its value to the one who perhaps conceived it but hesitated to carry it out. Any business, particularly one which must bid for public patronage, must necessarily be in the vanguard of progress if it is to succeed today. While it is perfectly true that the establishment of a commercial air service would not be feasible for the majority of railways, the adoption of some other idea which may have been lying dormant for months might be the means of achieving noteworthy results. The good will of any community is one of the most priceless possessions of its utilities.

Private Operation of Utilities Best for America

W. H. Sawyer, after study of Australian systems, is convinced that under conditions existing in this country public operation is less satisfactory. He talks to "Journal" representative of investigation made by him of the Victoria electricity supply system

BACK from Australia after a five-month survey of the publicly owned electricity supply system of the Victorian government, W. H. Sawyer, president of the East St. Louis & Suburban Railway and associated companies, speaking to a representative of *ELECTRIC RAILWAY JOURNAL*, said that he is strengthened in his conviction that private operation of public utilities is to be preferred under conditions that exist in the United States. During his stay, Mr. Sawyer, assisted by H. W. Eales, chief electrical engineer of the Union Electric Light & Power Company of St. Louis, prepared and presented a report on the status and affairs of the State Electricity Commission of Victoria and the scope and working of the state electricity commission acts.

In order to further the work, Mr. Sawyer was appointed a Royal Commission by the Earl of Stradbroke, Governor of the State of Victoria. The investigation covered the system of the State Electricity Commission for power generation and distribution, with particular regard to the general layout, the quality and efficiency of the plant, equipment and accessories and the methods employed; the works and projects now in progress and under consideration for extending the state's generating capacity; the sources of revenue from electricity supply and prospects of growth; a study of operating expenses and the reasonableness of the tariffs and charges; the agreement for the ultimate acquisition of the Melbourne Electricity Supply Company's undertaking; the economic value of and methods of working the brown coal deposits at Yallourn; the internal organization of the commission, and the system of distribution of electric power.

MR. SAWYER A PRODIGIOUS WORKER

The above outlines very briefly the job faced by Mr. Sawyer—a sizable proposition. In 2½ months he had not only completed a report, but had secured the acceptance of the major recommendations. Chief among these were the need for more practical information and experience in the work.

"Fundamentally," said Mr. Sawyer, "the undertaking is, as a whole, economically sound and by virtue of the importance of electrical energy to the state, it must go forward. The estimates given me by the commission showed that it will become directly financially profitable during 1927. With these estimates I differed. I agreed closely with the estimates as to the revenue to be ex-



W. H. Sawyer

pected within the next few years, but I believe that the operating expenses will be greater than have been assumed.

"In my opinion, the commission has proceeded in the past with information of an incomplete nature from its staff. The estimates now being made profit, to a certain extent, from past experience, but in general are even now too optimistic and are not based on the thorough analysis necessary in such undertakings. The net loss from the electricity supply system for the fiscal year ended June 30, 1925, was £241,000, and for the year just ended was approximately £200,000. For neither of these years was depreciation taken into account. With this included, as the commission proposes to do, beginning with July 1, 1926, I expect to see a net loss for the fiscal year ending June 30, 1928, but by the fiscal year ending June 30, 1930, there should be a net profit on the present combined undertaking and on practically every present separate undertaking.

"It seems to me scarcely to be necessary to refer to the immense amount of brown coal deposits in the State of Victoria, with which the generating station at Yallourn is supplied. The coal, while containing 50 to 65 per cent moisture, can be burned. There is a supply of it that is practically inexhaustible. It is so near the surface it can be mined by the open-cut method.

"While I criticised the estimates, the design, and the operation as to portions of the undertaking, it should be appreciated that many new and complicated problems were presented. Although the staff is composed of technically skilled men, generally speaking, it has lacked the practical experience to cope, to the desired degree, with the problems which confronted it. There is admittedly a scarcity of engineers in Australia who are familiar with large power-house design and operation and the other problems confronting the staff, including the complex problems of how to win and burn most successfully brown coal with 65 per cent moisture."

One of the outstanding recommendations in Mr. Sawyer's report was that the Victorian government permit more complete and frank publicity of the affairs of its public utilities, particularly as to finances. This he considered one of the past errors of the commission.

"One of the most difficult situations with which I had to cope," he said, "was the general disinclination to give frankly a statement of the situation. It was difficult to find out just what the situation was, and to get accurate and unbiased estimates. There usually was a desire to make the situation appear better than it was.

"Public office is looked on by Australians as a public duty. There are many high-class men giving their time to the state. Men who have been successful in business are willing to give of their time and energy to upbuilding the institutions of the country, even going to the extent of giving up other activities to do what is needed. This has resulted in a class of government it is difficult to match anywhere."

Mr. Sawyer's report on the power situation was received with enthusiasm by all parties. Before publishing his recommendations in final form, he had conferred with persons involved and had received assurance that the changes would be put in effect. In fact, many of the recommendations were adopted before the report was finished. The chairman of the Electricity Commission, Sir J. Monash, asked by a local newspaper man if any reply would be made to the report, said: "Why should we reply, when we have received so satisfactory a report."

Newspaper comment, of course, varied with the political complexion of the individual paper. But all of it was favorable to the report.

"My convictions are greatly strengthened," said Mr. Sawyer, "that privately operated public utilities with government regulation as in the United States are much to be preferred. This is despite the many conditions in the state and municipal governments in Australia that are an improvement over those of the states and cities in this country.

"Graft, as we understand it here, is virtually unknown. While the chief offices are elective, and their incumbents are changed from time to time as in the United States, the working staffs endure, so that there

is a continuity in the government that is lacking here. On the contrary, one of the handicaps of successful governmental operation of public utilities in Australia is that the system does not furnish the proper incentive to the persons in charge. Further, there is no appeal from the government methods if they do not furnish the proper service, while in this country when a public utility fails to supply the desired service its patrons can appeal to the regulatory commissions and compel the furnishing of adequate service."

On his trip Mr. Sawyer inspected a number of tramway and railway systems, both in Australia and New Zealand. He was impressed by the multi-side door cars, which were used to a considerable extent. These cars, he said, are somewhat similar to our old-style open cars, except that the sides may be closed in case of inclement weather. Loading and unloading are accomplished very quickly.

Moreover, the accident record is quite low, lower than one would expect with the running board along the side of the car and passengers boarding or alighting while the cars are in motion. Payments for damages are less than 1 per cent of the gross in some cases.

"Nature has been kind to Australia," Mr. Sawyer replied when asked regarding the characteristics of the country. "I was there during the fall, and found the climate very agreeable. The winters are mild and the summers, at least along the coast, somewhat cooler than ours. The vegetation is not unlike that of California, but it seemed to me the flowers are even brighter.

"The people of Australia seemed to me to be of the highest type. While they are typically British, they appeared even more cordial and sympathetic. Officially and unofficially every possible courtesy was shown me. At times, I felt overwhelmed by the wealth of hospitality and courtesy extended me everywhere. I also appreciated greatly the frankly helpful attitude of the many public utility officials, and of the manufacturers and manufacturers' agents. All of them not only furnished me with all data required but were of assistance in every way possible. Without this aid it would have been entirely impossible to complete my work in so short a time."

Typical Newspaper Comment on Mr. Sawyer's Report

Melbourne Herald, May 21

THERE will be a general feeling of relief in the community following upon the report of Mr. W. H. Sawyer on the State electricity scheme. The pronouncement by an acknowledged expert, after due investigation, that the scheme is "fundamentally sound" should allay all the fears generated in the minds of the public over a period of years by ill-informed critics, whose continued carping onslaughts were undermining public confidence. Mr. Sawyer's report, while pointing to certain necessary reforms, is a vindication of those who have been carrying it out in the face of heavy odds. . . .

The Government is to be congratulated for its wisdom in securing the services of an investigating expert at a time in the development of the scheme when such a course was necessary in the public interest.

Melbourne Age, May 23

MR. W. H. SAWYER, the American electrical expert, has completed the task with which he was entrusted by the Government of the State. He has investigated the various phases of the Electricity Commission's numerous activities, and the report he has presented deserves to be most carefully studied. The intelligent citizen is certain to be impressed with the common-sense spirit in which the investigation has been conducted, and with the practical observations and recommendations submitted. . . .

It has been a matter of extreme difficulty to get either Ministers or Commissioners to understand the precise nature of the public demand. Yet Mr. Sawyer seems to have understood instinctively. At his first attempt he has furnished much of the information the citizens of Victoria have wanted very urgently.

Melbourne Age, June 1

EACH political representative in this State should study the Sawyer report with meticulous care. It is a document concerning which he is destined to hear much in days just ahead. Neither members of Government nor of Parliament should allow themselves to be deceived by the seeming calm that has set in since the expert has made public his opinions on our State electricity scheme. . . . The Yallourn scheme may be a great success at some remote future date; that has never been in dispute. All that has been asked is—are we not moving too fast? The expert's answer is an emphatic affirmative. Several lines of economy and curtailment have been indicated. It is the Government's move. Members of the Cabinet should hesitate before they decide to try and hedge. They should not be misled by the public's apparent quietness. The public is eagerly waiting for the Government's action on the Sawyer report.

Los Angeles Railway Provides New Instruction Room

Car Equipment Effectively Displayed for Instruction of Men in Both Mechanical and Operating Departments

THE mechanical department of the Los Angeles Railway, under the direction of Chief Engineer P. B. Harris, has completed and made ready for use an unusually well equipped instruction room. The entire car equipment is presented to the men in such a way that

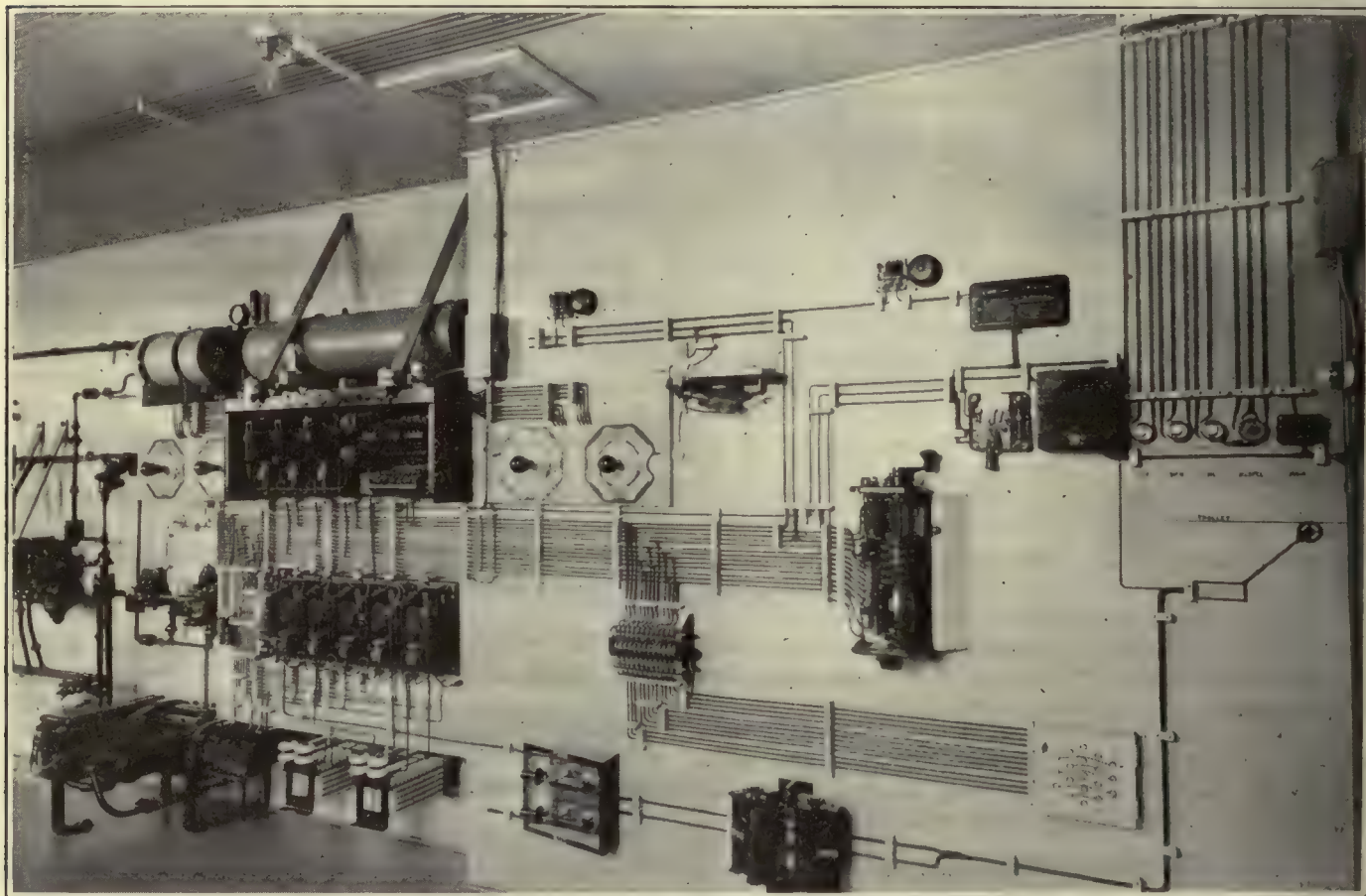
by different colors, and the complete motor wiring can be traced during demonstration to the men.

The signal bell system for both single unit and train operation is demonstrated and the wiring traced.

A complete car lighting system including sign lights is installed on the ceiling. This system is operated by a set of switches placed in the same manner as on a car. All wiring is open.

The air equipment is complete and all operations can be demonstrated and explained. The department intends to install the K control equipment as well as the HL.

An 18-ft. desk is placed about 5 ft. from the equipment for the use of the class in making notes and



All of the Important Elements of Electrical and Pneumatic Apparatus Are Effectively Displayed in This New Instruction Room of the Los Angeles Railway

they can acquire a good working knowledge of the various parts. All of the important pieces of car equipment are included in the layout as well as circuits and switches for car signals, lights, etc. It is displayed in such a manner that it easily may be seen by the men.

The equipment of the multiple-unit or HL control type of car is installed on the north wall of the room set apart as the instruction room. This equipment is used on the "H," "K," "F" and "L" types of car, of which there are 327 in use on the Los Angeles Railway lines.

Both the wiring and the relation between various operating parts may be easily traced and demonstrated. Pilot lights are placed over each switch. Lamps inserted in the motor circuit show both series and parallel positions, and can be operated with the motor cut-out switch in a manner that is very much the same as when in actual service.

Main and interpole field coils are easily distinguished

diagrams and for spreading out their blueprints or charts for study.

Selected men in the mechanical department will be given a complete course of instruction on this equipment. This course will consist of a series of short lessons extending over several months. Men will be required to make notes and diagrams and pass an examination after the course is finished. Only those mechanics who can pass a satisfactory examination will be given an opportunity to work on multiple-unit equipment. Many requests have been made from men outside the mechanical department, including a large number of trainmen, for the privilege of attending classes, so arrangements are being made to extend this privilege to as many as possible.

Those who are working directly with the equipment, either in inspection, maintenance, trouble shooting or operation, will be given first consideration for instruction.



In This Convertible Car the End Side Panels Are Stationary, but the Others When in Place Are Held by Bolts and Nuts

New York Railways Experiments with Convertible Car

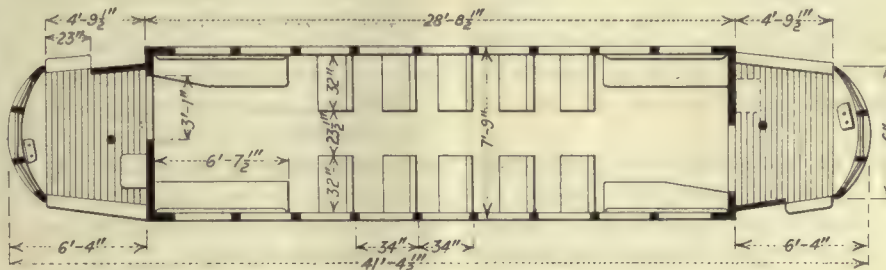
Novel Design Developed in Shop from Open Car to Avoid Use of Duplicate Bodies—Features Are the Method of Attaching the Side Panels to the Side Posts and the Use of Easily Detachable Platforms

UNDER the conditions of short-haul riding, which makes up a considerable proportion of the business on the lines of the New York Railways, open cars are considered to be attractive to passengers in summer. This, together with the difficulty of carrying out any extensive physical improvements under the receivership which existed for some time, accounts for the presence of 180 cross-bench open cars on the New York Railways property. After the receivership was lifted, in 1925, the obvious limitations of this type car, combined with the

high storage cost of duplicate equipment in New York City, led to consideration of possible improvement.

The solution for this situation seemed to the management to be a car having, as far as possible, the desirable features of the open car, so as to attract the short-haul rider, yet capable of being changed with the approach of winter to a closed car of the standard type.

This naturally meant a convertible car, with removable side panels, and this is the type of car which has been developed by the company for experimental purposes from a



Floor Plan of Reconstructed Car



The Interior View at the Left Shows the Arrangement of Seats, that at the Right the Method of Tapering One Longitudinal Seat at Each End to Provide a One-Piece Door with 37-In. Opening

former open-bench car. It differs, however, from other well-known cars of this type in several particulars, notably in the method of attaching the adjustable side panels to the side posts.

As shown by the illustrations, the adjustable panels extend from the letterboard down only to about opposite the top of the seat cushion, leaving a permanent lower panel about 18½ in. high, measured from the floor line. This permanent lower panel was adopted partly on the idea that it would be more comfortable for women passengers and partly to permit the use of a truss for the side sill. The adjustable panels are of wood and have two sash. The lower large sash is permanently fixed in the panel and the upper narrow sash is capable of being dropped. This plan permits additional ventilation for mild days in the spring and fall besides that afforded by the louvres in the monitor deck.

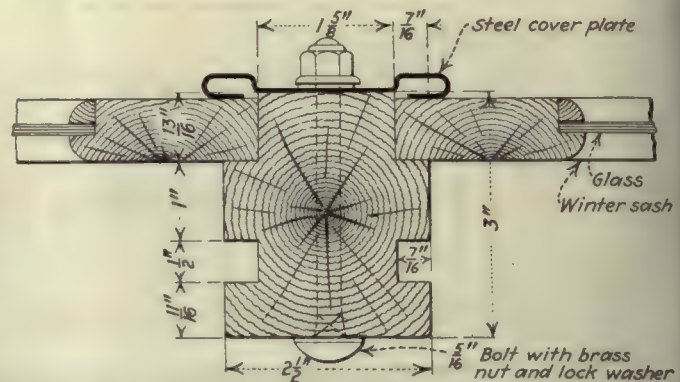
The adjustable panels described are seven in number on each side of the car, leaving two post spacings at each end on each side. This end spacing is permanently closed. The spacing next to this end panel has a lower solid permanent panel and a shorter adjustable panel with sash. The purpose of the lower permanent panel is to protect and conceal from the outside the backs of the longitudinal seats, of which there is one on each side at each end of the car.

When the panels are out the space between the side posts is fitted with a wire frame 24 in. high. This height was chosen as being just sufficient to prevent a child standing on the seat from leaning out beyond the side of the car.

The method selected for attaching the adjustable panels to the side of the car was chosen because it promised to provide a tight fit which would keep out draft in winter and permitted the use of attachments which would not rattle in summer. Briefly the panels are held in place by a steel plate, No. 16 gage, attached to the side posts by bolts. The vertical sides of these plates are bent over in U form, so as to provide continuous tension against the sides of the panel. The bolts which hold these steel plates to the side posts are fitted with brass nuts and lock washers as they are exposed to the weather.

The construction of the platforms is an interesting feature of the car. The framework upon which the convertible car was reconstructed, as stated, is that of the old open car. This meant when the car was changed to a closed car that platforms of ample length for entrance and exit had to be added at each end of the body. These platforms, which are 6 ft. 4 in. in length, are independent of the framework of the car and are arranged so that they can be detached in case of injury and another platform substituted. They are supported on each side by a ½-in. plate knee, attached to the side sill by five bolts. The platforms are fitted with Kass safety tread, both on the floor and on the steps. The latter are of the non-folding type.

Following the practice of both the New York Railways Corporation and the Third Avenue Railway on lines where there is a great deal of short riding, there are no platform doors, but there is a bulkhead between the body of the car and each platform. This bulkhead has a single sliding door, with 37 in. wide opening, the door being on the brake side of the car at each end. As the door opening is nearly half the width of the car, the left-hand rear longitudinal seat and the right-hand



Section Through Side Post Showing Steel Cover Plate for Holding Side Panels in Winter and Wire Screens in Summer

front longitudinal seat are tapered in width toward the door to give aisle space.

Besides these four longitudinal seats, there are ten cross seats, giving a total seating capacity of 40 passengers. There is also one drop seat for use on the front platform. The backs of the cross seats have hand grips, and at each end of the car, over the longitudinal seats, there are five Rico retrieving handles for standing passengers.

The register is of the Sterling-Meeker make, but is operated pneumatically by an electric solenoid actuated by the conductor's foot. Line voltage through a resistance is used for this solenoid. All lighting and heater wiring is in conduit, terminating in a cable box. The rest of the equipment includes K-27 controllers, two Westinghouse 310 motors, Westinghouse circuit breaker and air brakes, air sander, Peacock hand brakes, Columbia brake rigging and Hunter signs.

The outside finish of the car is in green, with cream striping and cream above the water table. The weight of the completed car with winter sash in place is 33,500 lb. or 817 lb. per seated passenger. The weight of the former cross-bench open car from which this car was constructed was 29,670 lb. The new car is designed for two-man or one-man operation.

While this car is being tested in service, to determine the possibilities of the design, the company is planning to rebuild one of its closed cars along these same general lines. It then hopes to determine its future policy in regard to the type of car best suited to the requirements of its service.



The Platforms Are Supported on Knee Plates Bolted to the Side Sills. A Platform Can Be Removed by Taking Out Five Bolts on Each Side

The Industry Needs a Modern Business Viewpoint*

Ample Opportunity Exists for Outstanding Success in the Electric Railway Business—Selling Sense Must Be Developed if Factors in the Way of Local Transportation Progress Are to Be Removed—Possibilities for Improvement of Equipment and Methods Have Not Been Exhausted

By Charles Gordon

Editor ELECTRIC RAILWAY JOURNAL

THERE is every reason to have faith in the possibilities of the local transportation business. I am convinced that this industry can be put upon a sound financial and operating basis. I look on the future with optimism. There has been no decrease in the desire of people to move about from point to point within their communities. In fact, there has been an enormous increase in this demand—so much so, that in even the smaller cities the outstanding problem of the day is to find space in which to move about. Surely under such conditions one must indeed be a pessimist to admit for a moment that the business of furnishing transportation for hire cannot be made of increasing service to the community and profitable to those who invest their money and energy in such an enterprise.

There is to my mind ample opportunity for outstanding success in the electric railway industry. Public transportation is a fundamental necessity to the development of modern communities. In most cities transportation development is notoriously behind the city's needs. That is because no industry will develop and expand until it has been put on a profitable basis.

I have no formula or panacea for eliminating all electric railway difficulties. There are, however, a number of considerations which suggest opportunities for improvement. Examination of these leads me to believe that we are just on the verge of an unprecedented period of local transportation development and prosperity but are held back today by our own state of mind and not by any fundamental defects in the industry itself.

I listened recently to a discussion on the need for courage, by men high in the industry's councils. Some of those present objected to any inference that electric railway men lack courage. In support of this contention was cited the fact that we have hung on in the face of most discouraging conditions and apparently insurmountable obstacles. But what else could we do? I would define that as perseverance and tenacity rather than courage. It takes courage to take the offensive. It takes courage to send good money after bad to build back an industry with nothing but faith in its possibilities as justification.

The industry needs imagination. It needs vision. It needs enthusiasm. It needs more self-analysis and more fundamental thinking. It needs to stop thinking poor. It needs to stop splitting pennies. It needs the nerve to demand rates of fare that will not only keep it

cut of receivership but will make it sufficiently profitable to attract new capital for extension and development.

Above all else we need a modern business viewpoint. We need to recognize not only that we are in a competitive business but that a selling sense is essential to the very existence of such a business.

THREE FACTORS THAT RETARD PROGRESS

There are today three general factors that stand in the way of local transportation progress. These are franchise restrictions, burdensome taxes and special charges like paving and street cleaning, combined with inadequate fares. Under franchise restrictions I have in mind primarily inadequate duration to permit proper financing and the inflexibility of many provisions that do not allow for changing conditions. I recently listened to a two-day discussion of these subjects at a sectional association meeting. Out of that meeting there came a thought which seems to warrant more than passing consideration. The general tenor of that discussion was a recital of what the electric railways should have. Organized effort was being made to convert public officials to a recognition of the needs of the transportation companies—not for adequate development and expansion, but for mere existence. At best these were mere expedients to give some measure of relief.

I tried to imagine myself for a moment in the position of one of those public officials. Assuming that he is an honest and conscientious public servant, harassed by the exigencies of modern public life, I tried to look on the electric railway situation and the electric railway executive as he would see them. And out of all this came the realization that in every contact with an electric railway man, he is asking for something. He rarely comes to offer something new. He rarely comes to sell anything. He rarely has anything that would afford a popular issue to put before the public.

On most properties the subjects of franchise conditions, tax and paving burdens and rates of fare are of primary importance from the standpoint of making electric railway operation profitable. But these measures for relief encounter public apathy or open opposition when they are presented as measures for the relief of the railway as such. It remains, therefore, to find a way of securing the improvement sought by presenting the situation from a new angle.

The procedure seems comparatively simple. Grand Rapids has made rapid progress in this direction, and other properties would profit from application of the

*Abstract of a paper presented before annual meeting of Midwest Electric Railway Association, Denver, Col., July 8-10, 1926.

same idea. The public judges electric railways and electric railway service by the condition of the cars and the employees with whom it comes in contact. Through improvement of the car itself rapid progress can be made.

Take, for example, an electric railway property which has an unfavorable franchise, heavy tax burdens and an inadequate rate of fare—and there are many properties in that condition. Introduce, if you please, a comparatively small group of new modern equipment of the finest type obtainable. Give all the publicity possible to the fact that the people of your city are entitled to such cars and the improved character of service which would be made possible with them. In other words, sell the idea that your town is entitled to such cars. Give the people a taste of the kind of transportation that can be given through improvement of the car—and then tell them how to go about getting it. Give them just a sample of what franchise improvement and an adequate fare would make possible. You are then “selling” the idea of transportation improvement rather than asking for it.

MANY CARS EXCESSIVELY LARGE

On many comparatively small properties there grew up years ago an ambition to operate large cars, of types comparable to those used in very large cities. There are today many of these cars in service. They are heavy, awkward looking and very expensive to operate. Although there may be a very short period during the rush hours when they are filled, they operate most of the day with a large number of empty seats. The operating cost is practically double what it needs to be. In addition the track construction is either needlessly expensive or is inadequate to withstand the pounding of heavy cars. Due to the high operating costs, headways are infrequent and many profitable prospective short-haul riders walk to their destinations instead of riding.

There is a peculiar tendency on the part of electric railway men to object to any inference that a car which was built before the inception of many modern improvements has outlived its usefulness. This may in part be attributable to the fact that an operator who has sponsored a given design of car considers it more or less a reflection on his own judgment and ability to admit that its operation is no longer justified. Operators take a peculiar pride in the very age of their cars, particularly if those cars were built under their direction. How often have you heard or used the expression “There’s a real job of car building. That car has seen twenty years of service and all she needs is a new floor, a little patching here and there and she’ll be as good as the day she left the shop.” Mechanically, that statement may be justified. But remember that we are not operating street cars to see how long we can make them run. We are in the business of selling rides in them. And if your twenty-year-old car won’t attract enough passengers at a sufficient fare to keep your ledger balance in black ink it is time that you either find one that will or make up your minds that street cars have outlived their usefulness.

We have for several years been trying expedient after expedient in the vain hope that conditions will change or that the public will recognize our predicament and come to the rescue with measures for our relief. That is to my mind a poor business conception. If the transportation business is content to accept public charity, it may expect to live in the poorhouse. If

you don’t believe there is something else in this business of selling transportation besides merely providing a vehicle that won’t break down in service, try to explain to yourself why you traded in that two-year-old automobile this spring for a brand new model. Maybe your wife had something to do with it. Remember at the same time that wives and mothers doing their shopping formerly made up a goodly percentage of that off-peak riding which is so rapidly disappearing.

There has developed no fundamental limitation in the street car itself. It is the most efficient and economical vehicle for hauling large numbers of people between their homes and destinations. If it is crowded out of existence, it will be because of our own lack of imagination, vision and courage and not because of any limitations in the vehicle itself. We have not begun to exhaust the possibilities for improvement of the car. There is not, so far as I have been able to find, any good reason why a car ride cannot be made sufficiently attractive to win ample volume of riding at a fare high enough to make its operation profitable.

But unless the industry arises to the need of the present situation, there is some danger that the street car may be swept aside by an impatient American public which demands change, improvement and progress. There has already grown up in the public press a dangerous tendency to stampede to the conclusion that street cars are an obsolete form of transportation. There are being held in New York City a series of hearings to determine whether certain street railways in that metropolis should be purchased by the city for the purpose of acquiring their perpetual franchises in order that the lines may be scrapped as nuisances and obstructions to traffic. The owners of those lines are willing to sell out on that basis. Even at the price of admitting that their lines are a nuisance and an obstruction to traffic they are trying to unload.

WHAT NOT TO DO IN TRANSPORTATION

It would take far more than a brief discussion such as this to analyze the New York transportation situation. To my mind, however, it offers the best examples of what not to do in local transportation to be found anywhere in this country. It requires little more than a glance at the equipment on some of the lines in that city to understand the wave of street car obsolescence discussion that has found its way into the press.

Nor is all the obsolete equipment which is giving this industry a “down-at-the-heels” reputation in the eyes of the public located in New York City. Country-wide surveys of the equipment situation have been made and published. There is no need of repeating them here. I commend them to your most earnest consideration. It is on the basis of the condition which these figures divulge, however, that I qualify my optimism regarding the future of street cars with the warning that they are in danger of being swept aside by an impatient public which knows little and cares less about the unprecedented combination of difficulties and unfair conditions which have been faced by our industry.

There is just another word to be added on this phase of the subject. A survey of car purchases for the first six months of this year indicates a total of 802 new cars. At this rate there would be a total of 1,600 cars purchased for the year, approximately the same number as during 1925, the lowest for several years.

A moment’s consideration shows where this is lead-

ing the industry. Assuming that all cars bought are for replacements and not for additional facilities, it would take at least 45 years to renew cars now in service. Of these, 25,000 are now more than twenty years old. Many are even much older. It requires no prophetic power to anticipate what will happen to the industry long before its cars are permitted to get into any such condition as is indicated by these figures.

There, gentlemen, is a most serious situation. The industry is today faced in the wrong direction so far as the condition of its cars is concerned. Street cars cannot run forever and any attempt to dodge the facts is suicidal.

There is not a single instance in this country today of a property which has even begun to exhaust the possibilities of improving street cars and street car service. How can we entertain for even a moment, therefore, the thought that the street car has outlived its usefulness? It has merely been the victim of our own lack of imagination and initiative.

I am not for a moment overlooking the fact that many railway executives have maintained a dogged determination to find a way out for their properties, in the face of the most severe and discouraging handicaps, obstacles and limitations ever faced by any industry. But now that we can look back on the past it becomes evident that we did not awaken to the changed conditions that were developing until they fairly engulfed us. We had been trained in the operation of a monopoly and we were nearly helpless when faced with the entirely different situation brought about by the sudden growth of competition.

The electric railway industry is far from obsolete. There is ahead a bright future of expansion and development on a profitable basis. The application of good selling principles to the improvement of the street car will do much to open the minds of the public and of bankers to the possibilities, that with imaginative enthusiasm and courage can be pushed forward to accomplishment.

The Human Element in the Industry*

Success Is Possible Only with the Co-operation of Men and Management—The Men Must Be Given Full Knowledge of the Aims and Purposes of the Company If Loyalty Is to Be Expected of Them—Results in Kansas City Show It Can Be Done

By F. G. Buffe

General Manager for the Receivers the Kansas City Railways

ESSENTIALLY the electric railway industry depends on the human element. Approximately 60 per cent of its total operating expense goes for wages direct. It draws upon the skill and labor of almost every profession and craft. Its sales force, made up of its trainmen, is recruited from almost every walk of life. These men are all engaged in preparing and selling a service to an exacting public, under trying conditions.

The very nature of the occupation, especially for the transportation force, requires long, uneven and exacting hours. A trainman must work while other folks sleep; he works hardest when other folks play. He is subject to the delays, annoyances and hazards of our increasing traffic problem. He meets with a public who too frequently show their cranky side when dealing with him. Of necessity he must obey a multiplicity of operating rules and be subject to strict discipline.

The electric railway industry operates and will continue to operate on a very narrow margin, and the morale of its organization can easily write the results either in black or red ink.

There was a time in the development of the electric railway industry, as well as in all industry, when little attention was given to the human side of the equation. Even today we find men in executive positions who, trained under the old régime, approach the human prob-



F. G. Buffe

lem in their industry with a mental reservation. Too often it was the case that capital demanded that labor make all the sacrifices in times of stress and always that dividends come first. It is today generally admitted that no industry should survive that cannot and does not pay a fair wage.

It is almost elemental that every plan for the improvement of the human equation, for better co-operation, for more intelligent service, must start with the payroll as a fundamental. It is an indictment that too often men have had to band themselves into an organization to secure fair wages and decent treatment,

rather than into an organization for making the business that pays them a success.

There is no especial quarrel with unionism. It is to be regretted that the old order of things often made it the only refuge for labor. As today organized and directed, it is part of our economic structure. I do not believe that in the electric railway world the same family feeling nor the same co-operation can be secured with a union as where there has been substituted for it a close working harmony between officials and men, where the men look to their officials as leaders rather than to outsiders. Personally, I would rather sit down around a table to work out problems than across one.

But union or not, the human element is there. It is only more complicated. Another factor enters to be taken into account. It is still possible to arouse inter-

*Abstract of paper presented before annual meeting of Midwest Electric Railway Association, Denver, Col., July 8-10, 1926.

est and enlist co-operation. Confidence can be secured. Improvement can be made.

The average intelligence of trainmen is high. They make hundreds of daily contacts. They are not in a rut. They look at life through a moving window. They will follow a forward looking management if given the opportunity. Because of the nature of the work and our peculiar relations with the public, it is essential that we get a co-operation of intelligence and spirit as well as of work. A large national concern has analyzed the average payroll and divided men into three groups. Out of every 100 employees there will be 10 per cent good, who are co-operating to the extent of their power; 10 per cent bad, who are radicals, loafers and disturbers, and 80 per cent neutral. If this large neutral class can be educated and developed into the good class, given an inspiration and an incentive that will place a personal touch in their daily work, make them alert for the best interests of their company, any effort and money spent in this direction is well placed. Capitalized at 7 per cent, the payroll of the Kansas City Railways represents an investment of \$70,000,000, or twice the physical value of the plant.

Men are naturally loyal to an organization of which they are members. There is a sense of pride in a connection with a progressive concern. Such loyalty can be turned to good account, but not unless a man knows something of the concern for which he works. There has been much said about laying our cards on the table and letting the public know what we are doing, but we certainly should consider that our own employees are entitled to more detailed information than the general public. Changes of policy, monthly reports, interesting facts in connection with the management should be taken up in general meetings and explained by the general officers of the company. Such a program stops gossip, kills false rumors, dissolves suspicion, arouses interest and adds to initiative.

There must be some method of self-expression; some voice in the conditions of employment; an opportunity for the adjustment of so-called grievances. Men should have some protection against the mistakes of authority when authority makes mistakes. The old days of "sending a man walking down the track talking to himself" just because some gang foreman said so are gone in modern industry.

AMERICANS EXPECT TO LOOK OUT FOR THEMSELVES

So-called welfare work is often a misnomer. Every upstanding American citizen prefers to look after his own welfare. He doesn't desire to be patronized or paternalized. Decent work rooms, proper toilet facilities, showers and clean-up facilities, good light, fresh air—these are not welfare. They are rights. They are as much a part of the job as benches, lathes and tools.

The industry, however, does owe to those who compose it an obligation to look after their interests. These obligations include protection in case of sickness or accident; medical attention; opportunity for saving and investment; co-operative effort in every line; family protection in case of death. These obligations should be fulfilled, but not handed to an employee as a matter of course. An employee should pay his proportionate part for the benefits received, and the industry should meet him half way in these payments. All such co-operative activity should be entirely in the hands of the employees, conducted by men elected from their num-

ber. The officials should help and assist by advice and counsel, but the actual handling of such matters, being paid for by the men, should be handled by them.

Such co-operative activities should be voluntary. A man should no more be made to take an insurance policy than he should be made to take a dose of castor oil. The opportunity should be given him, the benefits accruing to himself and his family pointed out, but if in the last analysis he cares to make his own insurance arrangements on the outside he should be permitted to do so.

With the help of the officials of the company, and guided and directed by the councils of the men, educational work should constantly go on. This educational work should not be entirely confined to those things that directly affect the property, but should cover a broader field and give to every man who desires to take the time and expend the effort an opportunity for self-improvement.

Company publications, when newsy and not full of bunk and propaganda, are very desirable, especially on a large street railway property where the various divisions and departments are scattered and where there are so many and varied forms of activity. Such a publication should not be a medium for company preachments, but should be an interesting magazine full of news for employees and their families.

SELECTION OF MEN VITALLY IMPORTANT

No obligation exists until a man is hired and becomes part of the organization. It would seem, therefore, that too much care cannot be taken in selecting applicants for employment. It costs no more to employ and train a 100 per cent physically perfect man than it does one who is imperfect. Every effort should be made to induct into the organization young men, because every large corporation, as time goes on, must face the problem of taking care of old and physically incapable employees.

In addition to an exacting physical examination, the applicant's record, his references and everything pertaining to his former experience should be carefully checked up, the idea being, of course, to secure the very best from the standpoint of training, environment, past record and association.

There is still a wide field for development in the various psychological and mental tests now being applied, and large companies everywhere are using certain of these plans in an experimental way.

Every employee of a company should feel that as a member of its organization he is part of the clan and that so long as he does his part he will be helped and protected in all of his affairs. Free legal aid and advice should be furnished; he should be protected against the rapacity of money lenders and installment sharks; he should be helped in time of personal trouble, and should naturally turn for protection in every case to his officials.

Fun and the social side of life should not be neglected, and every reasonable opportunity should be made to develop a harmonious family feeling in connection with the work. It is a good thing for the families of employees to become better acquainted with each other and with their officials. On the surface this seems unimportant and perhaps frivolous, but it has a most important place in the development of the human element.

Many of the books and papers I have read on this and allied subjects deal more or less entirely with men and

very little with management, meaning by management the supervisory forces from straw boss up. Surely management is a most important part of the human element. The business is essentially one of departments under department heads. Such being the case, it is essential to success that there be harmony, good feeling and team work between these departments. Personalities must be secondary to the primary purpose. Complete information, responsibility for results, and enough latitude so that these results can be obtained, will develop energy and initiative. Our interior departmental policies should be well defined. These policies should be a sort of North Star, the guiding principle by which every department head and every supervisory official can steer, and within the limits of these principles a good man should be given every opportunity to work out his salvation without nagging or petty interference.

"Yes men"—may the industry be delivered from them. And executives who won't permit their officials and assistants, high or low, to differ with them or to prove they are wrong, which frequently they are. There are organizations where they "yes" the old man to his face and damn him in secret. They let him blunder into mistakes because they have been taught to say "Yes, sir," and no more. They are saving their ideas and their energy for the man who some day will have brains and patience enough to listen to their suggestions.

Staff meetings are important and should not be confined entirely to the higher department officials, but should at times comprise the entire official staff. At these meetings company policies, especially affecting the personnel problem, should be thoroughly explained and discussed. It is often the case that foremen and other immediate contact points with the rank and file are out of step with major policies. Often lesser officials are not really considered part of management, but occupy a sort of an anomalous position. This can frequently be the source of trouble and misunderstanding, and every point of direct contact should be protected against misplaced and ignorant authority.

SOME CONCRETE CASES CITED

To keep down any imputation that this discussion is impractical, I am going to cite some concrete cases. Philadelphia, Brooklyn and Pittsburgh are examples of properties where the co-operation and support of the employees have been secured to a remarkable degree.

Kansas City began its present employee policies in 1919, when it had the opportunity to build up an entirely new operating organization following a severe strike in the early part of that year. Such success as the receivers and their officials in Kansas City have had has been largely due to the splendid functioning of its organization. It was one of the earliest properties in the country to adopt throughout a representation plan which provided for employee representation in every department of the property. It has a brotherhood, membership in which is voluntary, and to which 99 per cent of the employees belong. Each employee pays \$1.75 per month, the company helps financially, and the following benefits are provided:

Sick and accident insurance of \$15 a week for 52 weeks.
\$1,000 life insurance with the option of purchasing \$2,000 additional at the co-operative rate.

Free medical attendance.

Nurse service.

Co-operative grocery stores and meat shops.

The brotherhood also provides social entertainment

throughout the year for all departments and maintains a seven-team baseball league as well as a capable band. It is managed entirely by trustees elected by the employees and is an active institution.

A building and loan association with assets of \$500,000 is maintained and managed by the employees for the purpose of encouraging thrift and building homes for its members. Over a period of thirteen years it has never had a foreclosure.

The average age of Kansas City Railways employees is 37, and for the past six years every applicant for employment has passed a rigid, insurable examination.

Frequent meetings are held in every division, at which officials of the company explain financial statements, company policies and all other matters of interest.

All rules in connection with seniority, discipline, the purchase of uniforms, and other things affecting the men, are taken up and threshed out in the various committees.

There is a live company publication.

The men are helped in other ways, such as loans, repayable in installments without interest; free legal advice and help, and many others, small in themselves but important in the aggregate.

ENCOURAGING LOYALTY AND PRIDE

Loyalty and pride in the company and the organization are encouraged in every possible way. The results have been outstanding. When jitney competition was the chief factor in bringing about the receivership, the employees invaded the City Hall, petitioned their aldermen, and could not have been more active if the property was their own. Several years ago an attempt was made by imported organizers to form a union. This was put squarely up to the men, and I have in my files resolutions from every division and department that no such activity be permitted, and that any man who was approached by an organizer and who did not report the matter to his superior officer be immediately discharged. When the property went into the hands of the court, the employees employed an attorney to intervene in the case and petition the court that there be no change in the policies as affecting their Brotherhood organization or their other co-operative activities. These are only examples of what are every week occurrences.

Here I want to emphasize again that this type of co-operation from the human element in Kansas City, Philadelphia, Pittsburgh and elsewhere can only be secured when based squarely upon a just, fair and equitable scale of wages. I don't mean fancy wages, because these are not in the picture either for capital or labor. They must, however, be based upon living costs and be comparable with other trades, taking the steady nature of street railway work into account.

I am not a believer in the implied idea that a job, wealth or social position make any difference in our elemental processes and emotions. Mankind has the same feelings, the same ideals, the same aspirations, the only differences being those of education and environment. Under the veneer surge the same hopes, the same fears. Only yesterday we were skinclad and fighting for existence in primeval forests against the forces of nature. Fair treatment, a proper recognition of the brotherhood of man, and absolute sincerity will avail against prejudice. That concern in any industry is fortunate when its human element, both management and the rank and file, work whole-heartedly together for its success in mutual respect and esteem.



Here May Be Seen the "Kendrick" and Also One of the New De Luxe Buses

Wings the Latest Style for Railways

Philadelphia Rapid Transit Company Has Established a Regular Daily Passenger Air Service Between Philadelphia and Washington—This Is the First Commercial Service in the Country to Operate on Daily Schedules—Fokker Planes Used

EMERGING from its cocoon on the morning of Friday, July 16, the Philadelphia Rapid Transit Company's passenger air service spread its wings as an established institution. Twice daily in each direction flights are made between Philadelphia and Washington with large tri-motor Fokker monoplanes similar to the one used by Lieutenant-Commander Byrd in his successful flight over the North Pole. This marks not only the latest feat of the Philadelphia Rapid Transit Company in exploiting every conceivable form of public transportation, but it is also the first passenger air line in America operating on daily schedules.

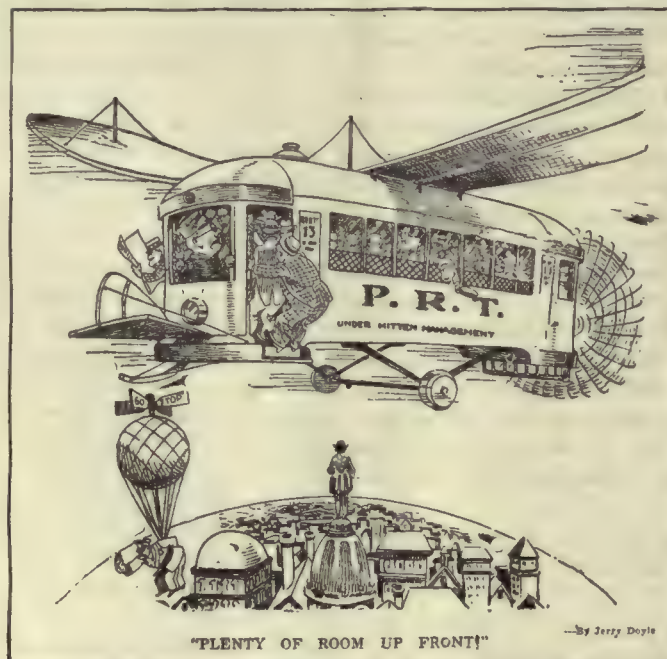
Several days prior to the inauguration of the regular passenger service a member of the editorial staff of *ELECTRIC RAILWAY JOURNAL* made the flight to Washington. In this way a first-hand insight into the undertaking was obtained. This venture appears to be based upon a foundation of reliable service far removed from the realm of hit-or-miss. Back of it is the bulwark of the air mail contract received from the government, which will assist materially in placing the service upon a sound economic basis. The passenger rates es-

tablished by the operators are sufficiently low to place the service within the reach of the average citizen, a condition essential to the continued popularity of the venture.

A particularly noticeable feature of the service is the high degree of comfort, which is easily comparable with that of the modern Pullman car. To one who has been used to bouncing around in the air currents with a small plane, the Fokkers give much the same impression as a dirigible in so far as stability of riding is concerned. And in the matter of safety the three Wright

engines on the planes make the possibility of a forced landing almost unheard of. Any one of the engines could drive the plane for a time long enough to pick out an adequate landing place. Such factors as these, as they become generally known to the public, will remove much of the nervousness which many yet feel toward aerial transportation.

The Philadelphia Rapid Transit Air Service, Inc., a subsidiary of the Philadelphia Rapid Transit Company, has been formed to handle the operation of the air service. Three of the planes have been ordered, two having been already delivered. These have been



As the Artist of the Philadelphia "Record" Sees the Latest Venture of the Local Transit Company

christened "Kendrick" and "Vare" and the third plane will be known as the "Hoover." At least for the present two regular trips every day will be made in each direction, the fare being \$15 one way or \$25 for the round trip, with a fifteen-day stop-over privilege. The distance covered is 125 miles and the flying time is one hour and a half each way. Each plane carries eight passengers, and 30 lb. of baggage may be transported by each passenger free of charge. Excess baggage is charged for at the rate of 25 cents per pound.

The planes leave from the Navy Yard flying field in South Philadelphia and Hoover Field in Washington but passengers are actually transported from center to center of each metropolis. Two de luxe buses have been purchased and officially dedicated to the air service. These leave the P.R.T. terminals at 237 Broad Street in

between Philadelphia and Washington, as well as an excellent glimpse of the nation's Capitol upon the approach and departure from Washington. Practically the only sensation of speed which one receives comes at the moment that the planes leave the earth, for the closed-in cabin shuts out the rush of wind which normally adds thrills to the airplane jaunt. It is probable that passengers will soon come to look upon the air service in the same matter-of-fact light with which one now embarks upon a steamship or steps upon a trolley.

EFFECTIVE WORK IN TELLING THE PUBLIC

An intensive publicity campaign has been carried on by the Philadelphia Rapid Transit Company in connection with its venture. Bulkhead signs and dash posters were used in the street cars and thousands of copies of



On This Trip Thomas E. Mitten, Chairman of the Railway's Board, Entertained Several Guests. Mr. Mitten Is Standing Fourth from the Right of the Group

Philadelphia and the Hotel Washington in Washington a short time in advance of the planes' departure and also meet the planes on arrival. The buses are small in size, being designed for the normal carrying capacity of the airplanes in passengers, baggage and mail. They are fitted up in much the same manner as the interiors of the planes. The latter are equipped with wicker chairs spaced for ample knee room, have inclosed cabins which make it possible for ordinary street clothing to be worn by the passengers, have also a lavatory and outside seats for the pilot and his mechanic.

Members of the air service personnel were carefully selected. Under the personal supervision of Anthony H. G. Fokker, designer and builder of the planes, will be the mechanical details of the service. He also is in charge of the flying and maintenance personnel and such men as Alton Parker, alternate pilot with Floyd Bennett on the recent Polar flight; Edwin Musick, former instructor in flying during the World War and formerly in the Havana-Key West service; and William DeWald, formerly a pilot in the U. S. air mail service and of long experience in European passenger service, have been selected as pilots. The operating manager is Victor Berteandias, one of the round-the-world fliers, chief inspector at McCook Field, and a member of Rickenbacker's famous war squadron.

The planes fly generally from 1,000 to 4,000 ft. above the ground, depending on the air conditions, and it is possible to get a very good view of the country-side

Service Talks were distributed among the patrons, describing the air service in detail and urging the public to make early reservations for the trip. Reservation blanks were attached to *Service Talks* and it was stated that seats would be held until the morning preceding the date of flight for persons filling out these cards and handing them to conductors or cashiers of the company, or mailing them in directly to the air service headquarters. Thousands of postcards have also been printed and are distributed free of charge. These carry a picture of the "Kendrick," the first of the planes to be completed, and are designed especially for transportation by air mail, as a place for a 10-cent air mail stamp has been designated.

The air service is, of course, a particular feature of the Sesqui-Centennial, but if it continues to meet with the success that has been accorded it during the first week of operation it is probable that it will be continued indefinitely. Passengers have been very enthusiastic in their comments on the trip and a large number of reservations have been received for dates in the near future. It is possible for P.R.T. not only to advertise the air service widely on its cars and buses but the airplanes themselves are very effective heralds of the company and its varied activities. The legend "P.R.T. Air Service" appears on the undersides of the wings and on the bodies of the planes and is readily discernible from the ground. The buses also carry the insignia of the new service.

The Readers' Forum

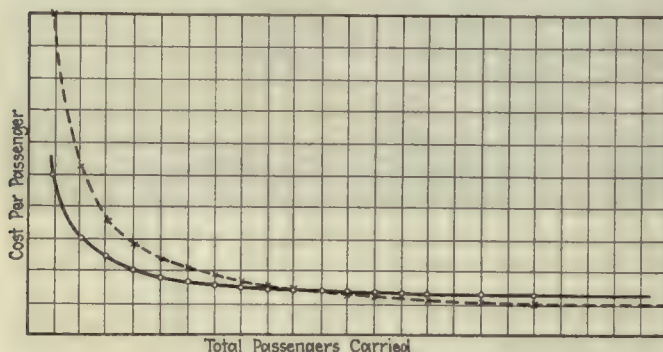
Graphic Study of Bus and Trolley Economics

NEW YORK, N. Y., June 10, 1926.

To the Editor:

Discussion as to the fields of the motor bus and the trolley includes psychological, social and economic matters. Some persons prefer to ride in a bus even if dilapidated and operated over poor pavements rather than to go the same distance in a new trolley car operated on new tracks. Most property owners prefer a bus line to a trolley in the street in front of their homes. On the other hand, trolleys have returned to the community more in taxes per passenger carried than have bus lines.

Each of these several factors in the long run is given an economic value. Any facility will eventually cease to exist unless it can operate without financial loss. The initial capital outlay per unit of transportation is higher for a trolley line than for a bus service. For each type the purely operating costs increase almost proportionately to vehicle mileage. In each case the total operating cost starts from a constant (larger for trolley than for bus) and increases roughly proportion-



This Diagram Is Entirely Hypothetical. It Assumes One Starting at Twice the Initial Cost of the Other but Increasing at One-Half the Unit Rate per Unit of Passengers Carried

ately to the number of passengers carried, the rate of increase being greater for a bus line than for a trolley. The unit cost per passenger would then decrease from infinity with zero passengers in each case so as to approach some constant. The rate of decrease would be different for each type and the constants would differ. At first the bus service would be the most economical. Finally, the two lines would intersect and then the trolley would become the cheapest.

Typical curves are very close together throughout a long range and in two individual cases may be reversed in position at any given total of traffic because of slight differences in managerial efficiency or of advantageous initial capital outlay.

Just so long as a bus line can be started with an initial outlay less per unit of transportation capacity than a trolley, just that long will it be cheaper to start transit operation with buses. Just so long as the rate of increase of cost per passenger carried is less for trolley lines than for buses, there will be a theoretical point beyond which it will be cheaper to operate a trolley than a bus line. If it ever happens that the rates of increase per passenger become the same for the two

types of transit, then the bus will supersede the trolley because the bus will be the cheaper for all traffic quantities. Until that time is reached there will be an economic field for each type of vehicle.

As between subways and either buses or trolleys, the same economic conditions hold as between trolleys and buses. With large masses of passengers and high density a subway will always show lower costs than either buses or trolleys. In a special case it might chance that the line for a subway system in the diagram would cross both bus and trolley graphs before the trolley graph crossed the one for buses. In that rare case there would be no economic reason for a trolley system.

In some circles there is a feeling often expressed that buses will eventually supersede trolleys in all cases. This may actually happen under the economic conditions outlined above, but the idea is also unfortunately being pressed where those economic conditions do not hold. It is something like the pressure to substitute bridges and tunnels for ferries without giving the ferry a proper chance in the light of modern technical knowledge. Undoubtedly a good deal of scrapping of trolley lines needs to be done at the present time, but what is necessary is probably largely a scrapping of old-fashioned, inefficient management methods or systems rather than a substitution of a new type of vehicle for an old one. This is believed to be a matter of importance in these times when the inclination seems to be to embark on huge expenditures for changes of physical system rather than the improvement of existing operating methods.

ERNEST P. GOODRICH,

Consulting Engineer

Regional Plan of New York and Its Environs.

School for Bus Operators at Akron

RECENTLY the Northern Ohio Power Company, Akron, Ohio, instituted a school of instruction for bus operators, realizing the great need of instruction in that field. The bus end of the transportation department really has grown so swiftly that it has run away from much of the old-time régime and is about to stand alone as a unit on the merits of its popularity. School is held at Kenmore shops at the hours of 9 a.m. and 7 p.m. on Monday and Thursday of each week. Twenty-one lessons with three reviews constitute the full course of instructions. Illustrated lectures of 30 minutes each are given by representatives of the mechanical department, the transportation department and the safety department.

B. S. Paugh, J. K. Petty and G. H. Shaw represent the respective departments composing this school and act as instructors. Every phase of mechanical equipment, bus operation and safety is being taught in this school. It is planned to extend the instructions to all operators, old and new, and the co-operation of every man on the payroll is expected in order to make the venture a success.

Strict attendance is requested of operators when notified to attend the school, for it is purely a bus operator's school, intended for none other than the bus operator and designed to make his work more pleasant for himself in every way. One of the chief purposes of this school is to prepare the operator thoroughly for his daily work and to increase the feeling of good will between himself and the public which he serves for his company.

Maintenance Notes

Metal Signal Flags for Section Crews

By D. H. WALKER

Assistant Engineer T. H., I. & E.
Traction Company

FOR some time past the section crews of the Terre Haute, Indianapolis & Eastern Traction Company have used cloth flags for posting along the track where work was being done. Each crew was equipped with two yellow flags for slow and two green flags for proceed signals. These flags required frequent replacement because of bleaching by the sun and natural exposure to weather conditions. Also in a strong wind they would often wrap themselves around the pole on which they were fastened and thus become practically useless as signals. This created a condition of danger for those working on the track, as the motormen were sometimes unable to distinguish the signal.

As an experiment we had made up in our shops a number of metal flags to replace those of cloth. These metal flags were 15 in. x 15 in. and made of sheet tin. A $\frac{5}{8}$ -in. solid iron rod about 5 ft. long was flattened out at the top and the sheet tin riveted to the rod. The rod was left projecting about 3 in. above the top of the flag in order that green or yellow lanterns could be hung on this when necessary to maintain signals after dark. The cost of making one of these metal flags was approximately the same as the cost of the cloth flags.

As a result of our trial we equipped each section with metal flags. So far they have lasted several months and show no deterioration. We expect them to last for at least a year and probably longer, while the cloth flags on most sections had to be replaced about three times a year. In addition, when metal flags become too dim for use as the paint scrapes off they can be repainted at a negligible cost and would then be as good as new again. The iron rod can be firmly planted in the ground and will remain undisturbed as a warning signal. Both section crews and trainmen are better satisfied and safer with the new



Better Protection for Trackmen Has Been Secured on the Lines of the T. H., I. & E. Traction Company by the Use of Metal Markers Instead of Cloth Flags

flag and our cost of maintenance for this item has been cut to a fraction of the cost of the cloth flags.

Trolley Wheel Mileage Increased by Better Contact

BY INCREASING the tension with which the trolley wheels press on the wire from 30 to 35 lb., the Department of Street Railways, De-

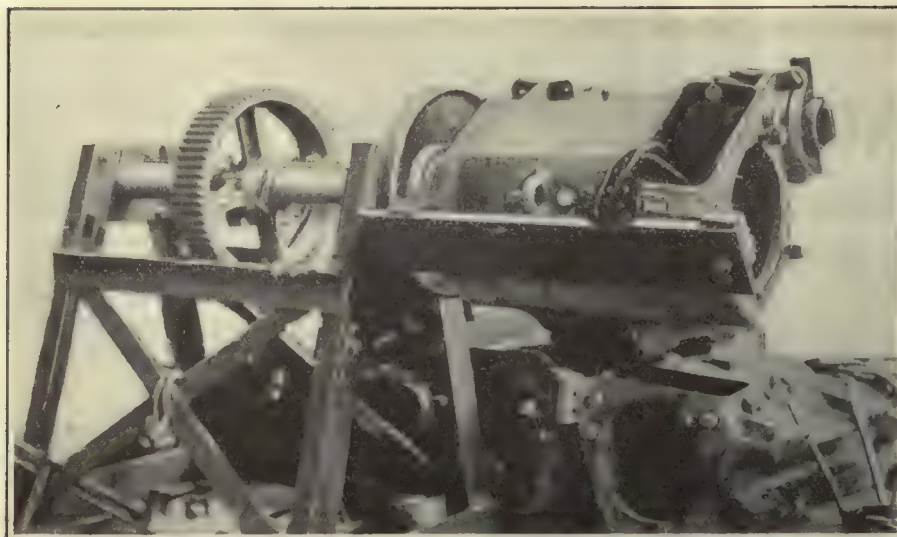
troit, Mich., has increased its average yearly mileage per wheel 20 per cent. The pressure is measured at a height of 18 ft.

Turret Lathe Saves Time in Finishing Bearings

FINISHING of bronze armature and axle bearings keeps a No. 2-B Foster turret lathe busy in the shops of the Department of Street Railways, Detroit, Mich. The accompanying illustration shows the set-up for doing this work. In the finishing of bearings the tools for the several machining operations are clamped to the turret head of the carriage. Axle bearings are finished in pairs. With the outside sections finished at the small end the remaining portion and the flange end can be finished and the bearings bored accurately without removing them from the lathe. The same method applies to the boring of armature bearings except, of course, that these are solid instead of being in two parts.



Finishing Bearings in a Turret Lathe in the Machine Shop of the Department of Street Railways, Detroit, Mich.



The Motor Frame Can Be Rotated to Most Convenient Position for Work

Handy Support for Motor Frames

FITTING pole pieces and mounting field coils in railway motors is often a back-breaking job. To overcome this the United Railways of St. Louis built the device shown in the accompanying illustration for holding the motor frame in any desired position while workmen do this. The standard is constructed of structural steel members and an old car axle is used to support the jig on which motor frames are bolted.

An old gear is fastened to the axle and used for a handle to turn the apparatus to the desired position

or as a lock to hold it securely. This lock is a short section of angle steel that can be slipped along the frame and made to engage between the teeth of the gear, thus effectively locking the apparatus in place.

Added Efficiency for Overhead Crane

GREATER usefulness has been obtained from an overhead crane in the shops of the Detroit United Railway, Detroit, Mich., by adding two air hoists. The crane, which is used in the truck overhauling shop, is of 20-ton capacity. Originally it had a chain hoist. Besides this, two

air-operated hoists have now been installed, one on either side of the chain hoist, and carriages have been added for moving these crosswise of the bridge. In lifting out truck parts the air hoist can be used independently. Where heavy loads are to be lifted the two can be operated in unison. The chain hoist is also available where needed.

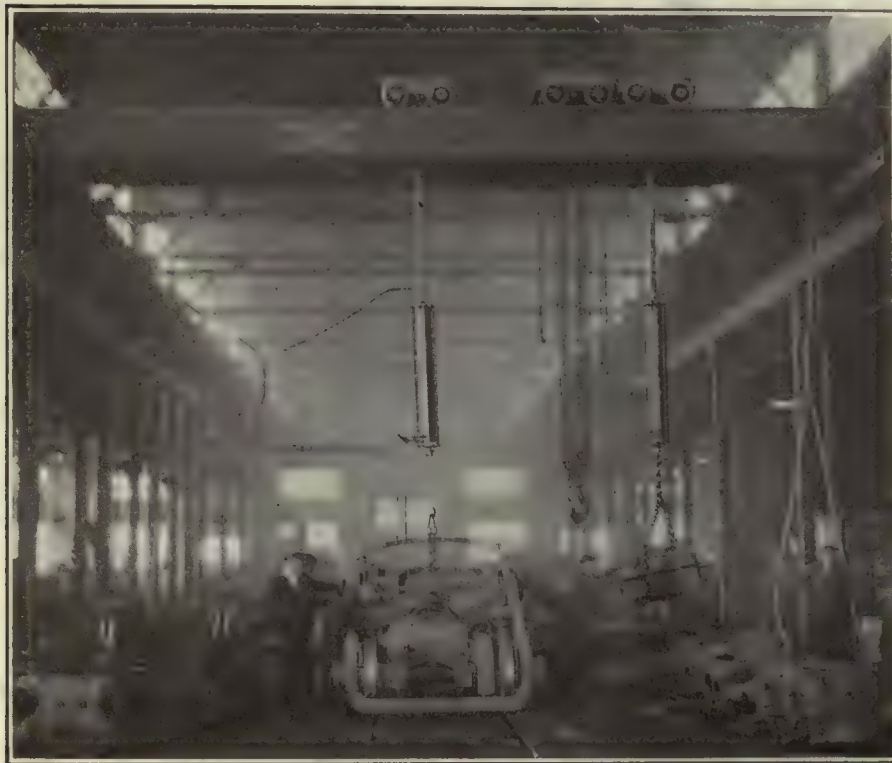
Aside from the two air-operated hoists, a 1½-hp. electric motor has been installed for operation back and forth over the overhauling bay. This motor is controlled from the floor.

Improved Babbitting Room in Los Angeles

REBABBITTING armature, axle and journal bearings in the shops of the Los Angeles Railway, Los Angeles, Cal., is being handled in a section just completed. The equipment now provided is fully modern. It consists of three electrically heated and automatically controlled unit melting pots and a preheating oven. In addition an electrically heated Oakite cleaning tank and various metal-lined bins and benches made in the railway shops have been installed.

The company's experience with babbitted bearings has shown that to obtain best results the lining metal must be heated to a definite temperature which must be kept uniform. The heating parts of the new equipment have thermostatic control which when set for the correct temperature is then automatically maintained at that point. The cleaning tank, heating parts and the preheating oven were installed in order to obtain the most efficient step-by-step process of production.

In rebabbitting bearings the old shells are first placed in the Oakite cleaning tank and boiled until clean. They are then placed in the melting pot and all of the old babbit metal is melted off. If the bearings are allowed to cool they are placed in the preheating oven and heated to the proper temperature for tinning. The bearings while hot have a flux applied to the surface which is to be babbitted so as to make the tinning metal adhere properly. All other surfaces are swabbed with a clay wash to prevent the adherence of the tinning metal. Mandrels and forms are provided for the different types of bearings. The bearing shell is placed in the proper fixture and the babbit is poured into it with self-skimming ladles to insure a clean and



Usefulness of This Crane in the Shops of the Detroit United Railway Was Increased by Adding Air Hoists

uniform texture of the metal. The bearing is allowed to cool gradually and the shell is then removed and machined to proper size.

Winder for Heater Motor and Smaller Armatures

WINDING armatures for heater motors and other smaller motors is accomplished with a considerable economy of effort in the shops of the International Railway, Buffalo, N. Y.

As compared with the old method of winding armatures by hand, which permitted of handling scarcely more than one armature a day per man, the new equipment developed in the I. R. C. shop for this purpose is now able to cope with eight or more units per day and but one man is required to handle it.

The winding machine was designed and constructed in the I. R. C. shops. It is equipped with a counter which counts the number of turns. The winder is turned by hand, the wire being fed from a spool and guided into the slots by means of a large shield as shown in the accompanying illustration. The shield is so curved that the wire is guided into the armature slots with practically no attention from the operator, thereby making for great speed in winding.

As each slot is completely wound the armature is given a fractional rotation and the winding continued in the next slot. Normally the machine is fastened to a wood block of considerable weight to give it stability.



Portable Resistance Arc Welder

CONNECTIONS for 400 to 600 volts and current steps from 30 to 210 amp. are provided on a new design of portable resistance type

resistance element has been worked out, as illustrated. Two designs of insulators shown by letters A and B are used, so that when assembled they are easily held together by a support frame C. The resistance wire D is coiled and placed in the

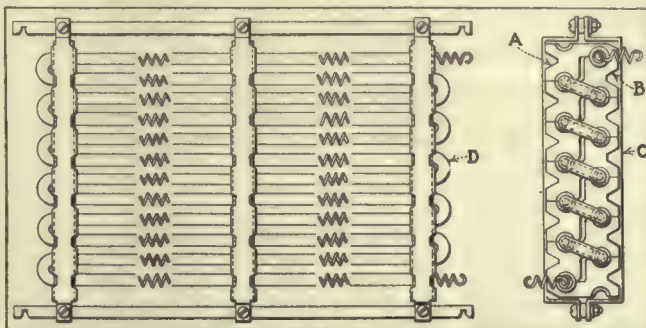
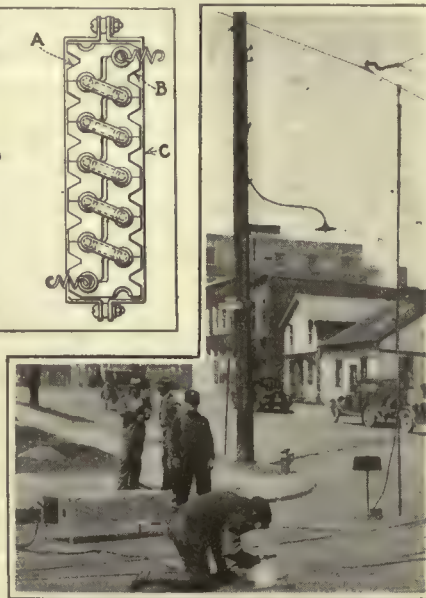


Diagram Showing the Design of Supports for the Resistance Element

arc-welding machine just placed on the market by the Ohio Brass Company, Mansfield, Ohio. Resistance elements are arranged on the unit plan, fourteen individual units being used. Any one unit may be removed without disturbing the other units. Instead of one complete element block for the full 600 volts two element blocks are used and these are insulated from each other electrically as well as from the main plane. Voltage stress on any one insulator is thereby cut in two and the possibility of shorts between resistance wires is greatly reduced.

A unique design of support for the



One of the New Portable Resistance Welding Machines in Operation

porcelain insulators as shown. An especially prepared heat-resisting porcelain has been developed to provide maximum strength, both mechanically and electrically, at high temperatures. Holes and sharp corners are avoided in the insulators in order to prevent breakage under rapid temperature changes. The insulator surface which supports the resistance coil D is made convex in order to give the greatest heat dissipation possible. The supporting frame assembly is so designed that if for any reason any of the porcelain should become cracked or broken it is still held in place and the resistance coils cannot short or ground.

The coil support spacings are very short, being approximately $5\frac{1}{4}$ in., which prevents any undue stretching or sagging of the resistance coil. The element illustrated is a 300-volt 30-amp. unit. Control of the machine is provided by a push button on the electrode holder and a contactor is supplied in the arc circuit. The main frame is grounded. These features afford the operator complete protection from shock. The machine is built wide and long.



Side and End Views of Armature Winder Designed by I. R. C. Maintenance Department

Association News & Discussions

Fares and Fare Collection Methods Demand Careful Consideration*

Fares Must Be High Enough to Insure Fair Return on Investment—
Various Combinations of Rates Being Tried—Theory
Must Give Way to Practical Business Demands

BY BARNEY W. FRAUENTHAL
General Traffic Agent United Railways
of St. Louis

THE ideal street car fare should accomplish two things, one possibly as important as the other. First it should produce sufficient revenue to pay all expenses, to provide for depreciation and to pay a return on capital invested in the property, sufficiently high to attract new capital. Secondly, it should be in convenient form and low enough to attract car riders.

A careful balancing of values is indeed necessary in devising a fare structure that will satisfy both of these conditions. Most electric railway operators know through experience that a fare can be so low that insufficient revenue comes in to pay operating expenses, much less a return on invested capital. There is no doubt that the "Dark Ages" through which the electric railway industry has just passed, were caused primarily by the fact that fares did not increase as fast as expenses. The franchises under which a majority of the companies operated called for a flat rate of fare, usually 5 cents, with no provision for adjustments to meet changing conditions. In other words, the ordinances governing fares were inflexible. With the formation of public service commissions the jurisdiction over fares was placed in their hands, with power to make such adjustments as were necessary to put the street railways back on their feet.

In St. Louis the adult fare was 5 cents up to June 1, 1918, at which time a 6-cent fare went into effect. On Sept. 20, 1919, the fare was changed to 8 cents cash, two tickets for 15 cents, seven tickets for 50 cents and 50 tickets for \$3.50. On April 10, 1920, the fare was reduced to 7 cents cash and 7-cent tickets. We are still operating under the latter fare, although application has been made by the receiver to the Missouri Public Service Commission for an increase to 8 cents cash and two tickets for 15 cents, the reason for applying for this increase being the fact that we are not earning a fair return under the 7-cent fare. The actual return for the year 1925 was less than 5 per cent. Thus you will see that at present our fare in St. Louis does not satisfy the first requirement of an ideal fare, namely, furnishing

sufficient revenue. Although our tokens sell for the same price as the cash fare, 7 cents, nevertheless for the year 1925 tokens sold amounted to 61.84 per cent of adult passengers. For the first four months of 1926 the percentage is 62.16.

Our tokens are sold at all car sheds, at the company's general offices, at various banks and stores and by the conductors. All parties other than the railways company sell these tokens merely as an accommodation to the public and receive no compensation. We have signs in practically all cars urging passengers to buy tokens in order to save time. A large portion of our tokens are sold by giving them as change to the passengers.

Some differentiation should be made between the frequent and the infrequent rider, since the former contributes a more dependable support to the

railway. However, the patron whose riding consists in going down town in the morning and home at night, six days a week, with no additional riding, is not particularly profitable to the company, since he tends to make the load factor low. About the only reason for wanting his business is to keep his automobile off the streets in the rush hours. If this passenger, in addition to his travel to and from work, will make several additional round trips each week, he will become a valuable customer.

In order to encourage such frequent riding railway managers usually favor a considerable concession in the price of tickets when sold in quantities, provided the cash fare is high enough to permit this, which it is not in St. Louis. Most railway men doubtless favor a 10-cent cash fare with tickets sold in half dollar or dollar lots. This would eliminate much change making, and because of the convenience of the dime would induce many to pay the cash fare who, if the cash fare were 8 cents, would buy tickets. Car riders may be divided into two classes. To one class the amount of the fare is of little or no importance. To the other it is of considerable importance. The convenient 10-cent cash fare would appeal to the former, and the low ticket fare to the latter.

From the passenger's standpoint, there is probably no great choice between paper and metal tickets, some doubtless preferring the former and others the latter. From the company's standpoint, metal tickets have the advantage of being repeatedly usable, and the disadvantage of higher first cost.

In a number of cities the weekly pass has been used with varying results. From the passenger's standpoint the pass has the following advantages: Many petty cash transactions are eliminated. There are no transfers to bother with, and the passenger can pick his own route. Stopovers may be made without extra cost. If the passenger rides frequently, money is saved. Since the use of the pass is voluntary, there are no disadvantages. From an operating standpoint the pass has the advantage of speeding up fare collection and thereby speeding up the cars, which of course reacts in the passenger's favor.

From a financial standpoint the effect of the pass may be either favorable or unfavorable. Many people spend more per week on carfare under the one-fare-per-ride system than they would under the pass system. With respect to these people, the introduction of the pass would mean a loss to the company. On the other hand, there are many people who ride exactly twelve times every week, always in the rush hour. If these people can be persuaded to buy passes at the price of, say, fif-

COMING MEETINGS

OF

Electric Railway and Allied Associations

July 28-30—Electric Railway Association of Equipment Men, Southern Properties, semi-annual meeting, Chattanooga, Tenn.

Aug. 11—Metropolitan Section A.E.R.A., annual outing, Pelham Bay Park, New York.

Aug. 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

*Abstract of paper presented before annual meeting of Midwest Electric Railway Association, Denver, Col., July 8-10, 1926.

teen rides, and to double their riding, the company will gain, since the additional rides will be taken in the non-rush periods, when they can be handled at little or no additional expense. In some cases the pass may prove an effective weapon of competition, since the pass holder will not be prone to divide his patronage. The pass is sometimes criticised on the ground that it is a departure from the principle of measured service. The usual flat fare is open to the same criticism.

Methods of preventing transfer abuses usually include one or more of the following: Directional indication, indication of lines to be used, time limit and date.

The round-trip abuse arises from the fact that in some cases three or more lines must be used in making a legitimate one-fare journey. Many people are not above taking advantage of this to go to their destination and return on a single fare. This abuse can be minimized by indicating upon the transfer the lines to be used, provided that the conductor knows where the passenger boarded the car. With the pay-as-you-pass and pay-as-you-leave system in vogue in many cities, the conductor does not know where the passenger boarded the car, and the line-to-be-used indication is not much protection.

The time limit is the most effective means of combating long stopovers. The worst form of this abuse is that in which the passenger rides to work in the morning and home in the evening for one fare, making both trips in the rush periods. In order to work this it is necessary either to use one of the round-trip schemes previously mentioned, or to exchange transfers with other persons working in the same place but living on different car lines. Enforcement of the time limit will, of course, eliminate this abuse, even though the issuing conductor is liberal in his allowance.

Rapid fare collection is an important desideratum in street railway operation, and this cannot be secured if any large amount of information must be placed upon the transfer by the issuing conductor and read by the lifting conductor. Therefore, the transfer system should be as simple as possible. In view of the difficulty of preventing transfer abuses which involve routes and directions, it may be good policy to adopt a transfer system which will be very liberal in these respects, and to concentrate on the time limit. Practically all the round tripping done for one fare under such conditions will be in the non-rush hours, and it is possible that the increase in travel brought about will balance the losses due to such round tripping. The conductor, being able to watch the time limit more closely, will be in a better position to check the dangerous abuses mentioned above in connection with long stopovers and use of transfers by other than the issuee. Elimination of disputes over routing will promote good public relations and tend to increase travel. Fare collection will be speeded up with consequent improvement of service.

In many cities a charge of 1 or 2 cents is made for transfers. This is discriminatory, since the passenger who

uses a transfer does not necessarily travel a greater distance than another passenger who does not transfer. The fact that one trip requires a transfer while another does not is due to the arrangement of operated routes. The transferring passenger is not responsible for this arrangement and should not be penalized for it. However, a transfer charge may in some cases be a more painless way of getting revenue than a higher fare. Also, it permits a somewhat lower fare and thereby permits the company to get more short-haul, non-transfer business, especially where there is some other competitive public carrier.

In some cities, largely in order to meet competition, transfers have been abolished entirely and the fare reduced. It sometimes happens that exact justice must be abandoned in order to keep a business going on to please its customers.

New Englanders Visit Casco Bay

ON THURSDAY of this week a delightful summer outing was enjoyed by 300 members and guests of the New England Street Railway Club at Portland, Me. Through the courtesy of the Cumberland County Power & Light Company the Steamer *Aucocisco* was placed at the service of the club for the day without charge, and free transportation from and to Boston by motor bus was supplied by the Mack Motor Truck Company. The party as-

sembled under the leadership of President Fred D. Gordon of Portland and members of his staff in the Cumberland County Company at 10 o'clock Thursday morning on the steamship pier serving the Casco Bay Boat Lines, and a most enjoyable trip down the harbor to Long Island followed. Amid the ocean breezes outdoor sports occupied the program for the rest of the forenoon, the events including contests for both men and women, a baseball game between the supply men and the railway men, which the latter won by a score of 10 to 7, and a tug of war in which the victory was reversed. After a shore dinner a steamer trip around some of the outer islands of Casco Bay was greatly enjoyed and the party disbanded at the close of an informal supper at the Falmouth Hotel. Many prizes for athletic events were awarded, among the donors being the following: Mack Motor Truck Company, White Motor Truck Company, John A. Roebeling's Sons Company, American Steel & Wire Company, Westinghouse Traction Brake Company, General Electric Company, Westinghouse Electric & Manufacturing Company, National Railway Appliance Company, Electric Service Supplies Company, Griffin Wheel Company, Albert & J. M. Anderson Manufacturing Company, Bemis Car Truck Company and Graybar Electric Company. Charles H. Wood was chairman and George E. Haggas vice-chairman of the entertainment committee.

American Association News

Entertainment

MEMBERS of the entertainment committee of the American Association held a meeting in the office of President J. J. Stanley of the Cleveland Railway on July 9. Those present were S. J. Cotsworth, chairman; J. H. Alexander, chairman of the exhibit committee; C. H. Beck, H. L. Brown, J. A. Dewhurst representing Charles Gordon, H. B. Doyle, R. N. Graham representing C. S. McCalla, R. A. Hauer, H. J. Kenfield, George Stanton, J. B. Stewart, Jr., J. V. Sullivan, W. F. Weh representing C. M. McCreery, F. H. Wilson, Paul Wilson, by invitation of the chairman; J. W. Welsh, executive secretary, and F. C. J. Dell, director of exhibits. Mr. Dell was appointed secretary of the meeting.

A committee was appointed to investigate the possibilities for golf, consisting of F. H. Wilson, chairman; Paul Wilson and W. F. Weh.

On the subject of music several propositions were considered. Full plans have not been made, but it was decided to have organ music in the Auditorium four times daily.

Sub-committees have been appointed to take charge of the entertainment each evening, as follows:

Monday—S. J. Cotsworth, chairman; C. H. Beck, H. L. Brown, C. C. Castle, George Stanton, J. B. Stewart, Jr., J. V. Sullivan, Paul Wilson.

Tuesday—H. L. Brown, chairman in charge of all arrangements, to select his own committee.

Wednesday—T. O. Kennedy, chairman. All exhibits are to remain open for the Cleveland public.

Thursday—E. P. Waller, chairman; W. J. Stanton, F. V. Gantt, K. A. Simon, L. J. DeLamar, Charles Gordon, H. B. Doyle.

In the absence of Chairman C. M. McCreery the report of the ladies' entertainment committee was read by Mr. Weh. It was decided to appoint a committee of Cleveland women to have complete charge. The following were appointed: Mrs. W. F. Weh in charge and Mesdames L. G. Sircoulomb, C. E. Ballou, J. H. Alexander, Morris Ireland, W. P. Hurst, Raymond Snell, H. K. Huack and G. M. Kryder.

Coffin Contest Closes Aug. 2

IN THE rules for the Coffin Award contest, Aug. 1 has been set as the latest date upon which presentations will be received. Since this year the date falls on a Sunday it has been decided that it will be only fair to accept presentations which are received on Monday, Aug. 2.

All presentations should be addressed to J. W. Welsh, executive secretary American Electric Railway Association, 292 Madison Avenue, New York City.

The News of the Industry

Strike on Interborough Subway Lines in New York Collapses

The strike of motormen and switchmen on the subway division of the Interborough Rapid Transit Company, New York, is over. The strikers, 300 of them, tacitly agreed on the night of July 22, without taking a vote, to go back to work at 10 o'clock on the morning of July 23. The action was taken at the Manhattan Casino, Eighth Avenue and 155th Street, after the leaders had announced the strike was lost and had cast blame on Mayor Walker, although the Mayor had come into the situation only at the eleventh hour.

During the evening the leaders of the strikers were in communication with Superintendent Abraham L. Merritt of the subway division of the Interborough. They planned to march in a body to the Interborough yards at Lenox Avenue and 147th Street on the morning of July 23 and ask to be taken back on the basis on which they were employed when they walked out.

No announcement was forthcoming from the company following the action at Manhattan Casino, but a statement made on behalf of Frank Hedley, president of the Interborough, during the afternoon, indicated that all the men would be taken back if they came as individuals. James L. Quackenbush, counsel for the company, has said frequently that the General Council of the Interborough Brotherhood will have to be consulted before the three men who led the strikers are put back to work.

On Thursday the Interborough again succeeded in increasing its service. While it will take some time to rearrange schedules, it was believed the subways would be back on normal operation either during the rush hour late Friday or within the ensuing twelve hours.

No Strike Likely in Chicago

William D. Mahon, international president of the Amalgamated Association, arrived in Chicago on July 15 from Detroit to assist in reconciling the demands of 14,000 surface lines employees, 5,000 rapid transit trainmen and 900 employees of the Chicago, North Shore & Milwaukee Railroad with the counter proposals of the several employer roads. He heard the grievances of the men at a joint conference on that day.

Conferring with Britton I. Budd, president of the Chicago Rapid Transit Company, on July 16, the union head was told that the company would stand firm on its demand for reduction of 5 cents an hour in pay instead of an increase of 5 cents asked by the men.

The elevated employees are seeking a wage increase of 5 cents an hour and insurance provisions, while the train-

men of the North Shore Line are asking an increase of 6 cents an hour. Similar demands are being made by trainmen of the Chicago Surface Lines, who now receive a maximum wage of 75 cents an hour. The demands of all but the Surface Lines employees have been rejected.

Bandits Get \$8,000 East St. Louis Pay Roll

Robbers held up a car of the East St. Louis & Suburban Railway at Nineteenth and State Streets, East St. Louis, Ill., at 1 p.m. on July 19 and escaped with about \$8,000 in cash which was being carried to a downtown bank. Five men who accompanied the money were lined up by the robbers.

A relay system of automobiles was used by the robbers in escaping. They drove from the scene in a green Lincoln and at Seventeenth and Broadway transferred the money to a Ford roadster. Two of the men went north to the Tri-Cities in the Ford, two drove away in the Lincoln, while the other two transferred to a large blue car, which went east on Broadway.

The money had been collected from the carhouses and was placed in two valises in the center of the trolley, which was being run as a special.

Substitutions Sought in Buffalo

The International Railway, Buffalo, N. Y., applied on July 16 to the Public Service Commission for approval of a declaration of abandonment, authorized by the stockholders of the company, covering that part of its line on Delaware Avenue in Kenmore from near Kenmore Avenue, and running along Delaware Avenue to the connection with the Buffalo-Tonawanda-Gratwick line near the Ellicott Creek Bridge in Tonawanda and that part of the line starting from Delaware Avenue and Schell Road in Tonawanda about 1,283 ft. in Schell Road to the end of the track.

The company says that this part of its line is no longer necessary for the successful operation of the road or convenience of the public. Receipts from transportation of passengers are considerably less than expenses and there is apparently no prospect of an increase in traffic sufficient to provide an adequate return on the basis of existing fares.

The International Bus Company also filed a petition for a certificate for the operation of a bus line in Tonawanda, Kenmore and the town of Tonawanda under local consents granted to it. It is planned under the application to extend the Delaware Avenue bus line now operated in Buffalo from the Buffalo city line and provide a substitute transportation service, if abandonment of the railway is permitted.

New Franchise Deal Wanted in Sacramento

The Pacific Gas & Electric Company has presented a proposal to the City Council of Sacramento, Cal., providing for six major bus line extensions and changes in its present system based on an anticipated 7-cent fare and conditioned on the understanding that the city authorities will acquiesce to an application to the Railroad Commission for an increase in fares.

The extensions and changes would serve growing districts and are based on a survey conducted by the company. The survey was the outcome of a conference held several weeks ago by city officials with Wiggington Creed, president; P. M. Downing, vice-president, and other officials of the company.

The proposal is signed by Mr. Downing, who says that if the fare is increased to 7 cents the system will earn 3.5 per cent on its present capital investment under existing conditions. He said:

Our proposal, as outlined in our conference on May 5, is that we provide the additional bus service as set forth with the understanding that the City Council acquiesce in our applying to the Railroad Commission for an increase in fares.

The proposal reiterates previous statements of the officials that they are unwilling to make any additions to their present street railway trackage.

The bus line program proposes the establishment of new lines to serve the junior college district, territory north and east of McKinley Park, territory in the vicinity of 57th and M Streets, and T Street from 28th Street to 57th Street. A "crosstown" line over 39th Street from D to Third Avenue and 35th Street would serve territory en route and provide interconnections.

No Dealings with Indianapolis Strikers

Federal and state courts in Indianapolis, Ind., have taken the center of the stage in the strike of unionized trainmen of the Indianapolis Street Railway. Court action is being started as the result of vandalism that has marked the recent progress of the strike, including the dynamiting of cars and the injuring of passengers.

Hope of arbitration of the demands of the strikers is waning. It is understood Governor Jackson feels there is no occasion for him to act in the absence of an emergency and Mayor Duvall said he felt he had no power to take any action, regardless of the passage of a resolution by the City Council on July 19 calling on him to take steps looking toward a settlement.

Four men were arrested Tuesday by agents of the United States Department of Justice charged with vagrancy and

held for investigation in a probe of dynamiting of cars.

No statements were made by officials of the company following their declaration Monday that they would decline to deal further with any of the strike committees looking to arbitration or any settlement other than that provided in the contract the company holds with its men.

In the meantime service seems to proceed as usual. The company now is turning down applications for employment and all cars are in operation, even the special one and two-trippers used in the morning and evening rush hours. Apprehension seems to be felt only late at night.

The Peoples Motor Coach Company, which formerly stopped its service at midnight, now operates during the entire night.

At night police ride virtually every car, and in every case where dynamite has exploded beneath the cars a policeman was riding the car. Thus far none of the police officers has been injured, but the vandals in each case have succeeded in making their escape before the officers on the cars could obtain any information of value.

John M. Parker and Robert D. Armstrong, vice-presidents and organizers for the Amalgamated Association, appeared in federal court at Indianapolis on July 22 and pleaded not guilty to contempt. They were charged with violating the federal injunction prohibiting them taking part in the strike in Indianapolis. Both pleaded for time, through their attorney, and were given until Monday to answer the charges. They were released on \$10,000 bond each. The court informed the attorneys for the men that he wished all street car cases settled before the end of next week. He said he wanted attorneys to be ready, in case he overruled answers to the information, to try the case by next Wednesday.

By Thursday evening a total of eight, including the organizers, had been arrested on contempt charges, in connection with acts of vandalism. The other six pleaded guilty. They are being held without bond.

In talks to the other six men arraigned, Judge Baltzell informed them that they had a perfect right both to organize and to strike, if they so desired, but he intended to put a stop to acts which jeopardized property rights or endangered the lives of passengers.

All Chicago Riding Records Broken

Revenue rides on the Chicago Surface Lines during the month of June totaled 132,980,301, exceeding the corresponding month last year by 7,295,392. The average daily rides for the month, 4,432,677, reached the highest total in the company's history. During the three days of the International Eucharistic Congress, which was held in Chicago from June 20 to June 24, the surface lines carried 15,055,000 passengers, the largest total ever recorded by any single transportation agency in the city in a similar period.

This is the thirteenth consecutive month showing an increase in riding on the surface lines. During the first six months of the year there has been a gain of 29,313,867 over the corresponding six months of 1925. This increase, company officials declare, is greater than the increase for the entire twelve months of last year.

The income account for the month of June is as follows:

	1926	1925
Gross earnings.....	\$5,135,965	\$4,829,004
Residue receipts...	1,137,160	982,493
Divisible receipts...	446,005	301,169
City's 55 per cent.	245,303	165,643
Company's 45 per cent.....	200,702	135,526

Reappraisal of Rochester Properties to Be Argued

As a result of a decision by Supreme Court Justice Adolph J. Rodenbeck the city of Rochester has won its fight to bring to trial this fall its long-standing suit for a reappraisal of the Rochester lines of the New York State Railways under the service-at-cost contract between the railways and the municipality.

Justice Rodenbeck denied a motion of the railways to dismiss the city's petition for a revaluation. The corporation maintained, through its attorneys, Harris, Beach, Harris & Matson, that the city, by delaying to ask for a review of the appraisal in the first two years of the service-at-cost contract, had forfeited its right to ask for such a review. The court ruled:

There were issues raised in the motion that could not be determined save by a trial and the city is not barred by any delay or by its acts from raising questions in this suit.

The record now in court shows that there is a question of fact as to the proper rules used in appraising the property and to the fairness and reasonableness of the appraisal arrived at.

It is expected that the suit will come up at the equity term of the Supreme Court in October in Rochester.

James F. Hamilton, president of the railway, said he would not appeal Judge Rodenbeck's decision and that the railways would be ready for trial in October.

The question has been hanging fire for more than three years. Five years ago the properties of the New York State Railways in Rochester were appraised at \$19,216,000. The service-at-cost contract was put into operation then, with these valuation figures as a basis.

The Bureau of Municipal Research made a study which led to a recommendation that the appraisal be tested in court and a complaint against the five-year period of values which the appraisers used to determine reproduction costs. The bureau claimed the appraisers based their findings on figures for pre-war and war-time years when peak prices were in order, both for labor and material.

Mr. Hamilton maintained that a reappraisal would show the figure to be nearer \$27,000,000 than \$19,216,000.

The point at issue in the motion before Justice Rodenbeck had no actual bearing on reappraisal values but simply concerned the issue whether the city by its delay had not forfeited its right to ask for a review.

Franchise Hearing Held in Kansas City

Mayor Albert I. Beach was the principal inquisitor at the first Council hearing on the proposed new franchise for the successor to the Kansas City Railways, Kansas City, Mo., under reorganization. The old franchise, now in operation, has eighteen years yet to run, but the new owners and at least a portion of the city fathers deem certain changes in the franchise provisions beneficial to the successful operation of the system in future.

In answer to other questions, W. G. Woolfolk, who will be president of the new company, said the entire property of the Kansas City Railways will be owned by the Kansas City Public Service Company, but that the property in Kansas City, Kan., would be operated by the Wyandotte Street Railway, the securities of which will be owned by the Missouri corporation.

Councilman Gossett, who introduced the new ordinance, appeared to think that the entire system should be owned and operated by a single company. He asked Mr. Woolfolk if there is anything to prevent that plan being used. The latter agreed that it might be arranged. Mr. Gossett declared that he wanted that phase of operation provided for, but he mentioned none of his reasons for such demand.

Mr. Woolfolk told the Councilmen that securities will be more readily salable under a new 30-year franchise than under operation in the remaining eighteen-year period of the old franchise, and that new money would be brought to the property, benefiting both the company and the city. He also pointed out that the company is asking that the bus franchise be made a part of the railway franchise and that any excess return from the bus system would tend to reduce the car fares.

Mr. Woolfolk further discussed the question of service at cost, the 8-cent maximum fare provision of the proposed grant and the possibility of the lower fares as provided therein, and pointed out that if a higher fare was ever needed, it would have to be obtained by application to the Public Service Commission.

He said that it is planned to spend \$2,000,000 during the next three years in rehabilitation of the system. Eventually all power will be purchased.

New Louisville Grant Introduced

Following discussion for several months of the terms of a new franchise ordinance for the Louisville Railway, a proposed new grant was recently introduced in the City Council and placed in the hands of the revision committee.

The new ordinance would require a 7-cent fare for two years, or the same rate as is now being paid, but without a sliding scale. It also provides for transfers from bus lines of the company to street cars. This would permit suburban service to be increased through using the buses as feeders.

The Board of Public Works would supervise the management of the railways and the company would pay about \$10,000 a year to the board to defray administration expenses.

Chestnut Street Subway, Philadelphia, Nearer Reality

Virtually the last obstacle to the construction of the Chestnut Street subway has been removed with the consummation of an agreement between the Philadelphia Rapid Transit Company, Philadelphia, Pa., and the franchise-holding underlying transit companies.

The covenant indicates an early start on the tube, which eventually will mean the removal of surface tracks from Chestnut and Walnut Streets between the Delaware River and 22d Street. Consent of the Public Service Commission, which is understood to be ready to approve the program, and passage of a track removal ordinance by City Council are all that remain for complete approval of the project.

City officials say there is to be no change in the original agreement between the city and the Philadelphia Rapid Transit Company under which the municipality would build the \$20,000,000 tube and the transit company would undertake to cancel the debt by paying the interest and sinking fund charges. Under that agreement the subway would become the transit company's property when the indebtedness was fully paid.

Traffic Census Under Way in New York

A traffic census is being conducted in New York to find out from each one of the 1,500,000 workers in Manhattan by which of 36 different lines of transportation he or she goes to work in the morning and the time of arriving at work. With this information it will be possible to make better use of existing transit facilities. If the necessary readjustments in riding habits can be brought about it is believed the capacity of present facilities can be increased 25 per cent.

Railway Operation Suspended by Hartford-Springfield Line

The Hartford & Springfield Street Railway, Warehouse Point, Conn., has discontinued all railway operation and will substitute further bus service as rapidly as permission can be secured from the State Department of Public Utilities.

For some time railway service has been operated between Hartford and Springfield on Saturdays only. The Warehouse Point-Rockville branch operated daily. Originally the Hartford & Springfield lines totaled 35 miles, the main line extending from the Massachusetts-Connecticut state line to East Windsor, Conn., where it connected with the Connecticut Company's lines. This line totaled 14 miles, and from the terminal points operated over the Springfield Street Railway lines and the Connecticut Company lines. The Warehouse Point-Rockville branch is 13 miles long and the Somersville-Thompsonville line 8 miles long.

The company has been authorized to operate buses between Phelps Corner and Rockville via East Windsor. It has been operating buses between Hartford

and Springfield for some time. The new bus route will parallel the railway and the fare per zone will be 10 cents, with the exception of Rockville, where 15 cents will be charged to protect the Connecticut Company.

What to Do Before the Doctor Comes

Officers of the Detroit chapter, American Red Cross, recently presented certificates as first-aid instructors to ten employees of the Department of Street Railways, who formed the winning team in the recent state competition conducted by the Red Cross at Ore Lake, near Brighton. Of 35 teams entered the railway men captured first, second and third places and won a handsome loving cup.

First-aid instruction has been emphasized by Col. H. U. Wallace since he became general manager of the department. This first team will now organize other teams throughout the entire system and a team will be entered in the national Red Cross competition in the fall.

Emil Helferich is captain of the first-aiders and his team follows: John McGinity, Paul Penn, Harry Van Scriber, Muriel Shunk, Al Wiler, Steve Jass, George Duff, H. O. Johnson and G. Ruedesluix.

The Red Cross will have a national competition in Michigan this fall and the municipal railway hopes to bring home another cup.

Traffic Survey of Birmingham by Ross W. Harris

Ross W. Harris, traffic expert of Madison, Wis., has been selected to make a city-wide traffic survey of Birmingham, Ala., at a cost of \$30,000, the expense to be borne jointly by the city and by the Birmingham Electric Company. It is expected the study will take from four to six months to complete. The problems to be studied include a thorough investigation into the parking question, downtown traffic congestion, street car routing and turning places, street car delays and residential traffic.

Wage Contracts Renewed

The Auburn & Syracuse Electric Railroad, Syracuse, N. Y., has signed a contract with its employees for one year, running from May 1, 1926, to May 1, 1927, on the same basis as last year's contract. The employees had asked an increase of 8 cents an hour.

The agreement between the San Antonio Public Service, San Antonio, Tex., and its employees covering wages and working conditions was renewed on July 1 by the clause which provides that all conditions shall remain the same for another year without change.

The Butte Electric Railway, Butte, Mont., has entered into a new agreement with its employees effective for a period of two years from May 1, 1926. The old wage rates will be continued.

Negotiations for a new contract between the Chicago & Interurban Traction Company, Chicago, Ill., and its em-

ployees have been postponed, but will be reopened some time later this fall. The wage scale, which expired June 30, will be continued in effect.

The wage agreement between the Rochester & Syracuse Railroad, Syracuse, N. Y., and its employees has been renewed for one year from May 1, 1926, without change.

The Syracuse Northern Electric Railway, Syracuse, N. Y., has renewed the agreement with its employees for one year from May 1, 1926, without change.

The agreement between the Richmond Light & Railroad Company and Southfield Beach Railroad, Borough of Richmond, New York, N. Y., and their employees, which expired June 1, 1926, has been renewed under the same terms and conditions as in effect last year.

The agreement between the Empire State Railroad Corporation, Syracuse, N. Y., and its employees has been renewed for one year from May 1, 1926, without change.

Public Utility Speakers for Ohio Schools

Emphasizing the fact that school students, and the public generally, cannot be too well informed on public utility matters, Vernon M. Riegel, State Superintendent of Public Instruction for Ohio, has sent a letter to all school superintendents in the state suggesting that they arrange for utility speakers to address student bodies. This letter was sent as a result of a conference which Fred J. Bollmeyer, director of the Ohio Committee on Public Utility Information, had with State Superintendent Riegel. As a result school talks have already been arranged through the Ohio committee. A copy of the letter follows:

It is always helpful to be able to give students in the latter years of school authoritative information about forces and factors which condition our economic life. There is woeful ignorance as to the functioning structure of modern industrial society. In this industrial society our public utilities hold a somewhat unique position.

The public cannot be too well informed on public utility matters and needs information on all phases of the problems involved. There has been organized an Ohio Committee on Public Utility Information for the purpose of disseminating information from the utilities' standpoint about four of these industries, electric light and power, gas, telephone and electric railways.

The Department of Education does not want to thrust speakers upon the public schools. It does, however, want the schools to know that this committee stands ready to send speakers—men and women experienced in public utility work—to schools upon request. There would, of course, be no expense attached to these addresses before student bodies.

Extension of Winnipeg Grant Likely

It now appears certain that the Winnipeg Electric Company, Winnipeg, Man., will receive an extension of its franchise. Under the charter the city must give the company six months' notice of its intention to purchase the street railway, and if it fails to give such notice the company receives, automatically, a five years' extension of its franchise. No action has as yet been taken by the city in connection with the purchase of the railway, and in view of the fact that the time limit for serv-

ing notice expires in August, it is regarded as certain that the company will receive its extension.

Although the company has not yet served notice of its intention to do so, it is rumored that it will apply for a longer extension than five years, in order to permit it to carry out satisfactory financial arrangements to take care of extensions to the system.

About four years ago there was considerable agitation, particularly among the Labor Aldermen, in favor of the city purchasing the street railway, but this agitation has completely died down.

Railway Presented to City of St. Petersburg

The first extension of the municipal railway at St. Petersburg, Fla., in the last thirteen years was opened recently when a line to Shore Acres, subdivision, was placed in service. The line was constructed by a local realty concern at a cost of about \$90,000 and turned over to the city. It is 3 miles long.

N. J. Upham, president of Shore Acres properties, and past-president of the National Association of Real Estate Boards, made a brief speech and formally presented the system to the city of St. Petersburg, through Mayor Pearce, free and clear, the municipal railway to operate cars over the extension at any schedule deemed sufficient.

Mayor Pearce accepted the gift in behalf of the city and spoke of the appreciation and the benefit the city will derive from the extension.

Extension of One-Man Car Service in Milwaukee

The introduction of one-man car service on another line in Milwaukee, Wis., on Oct. 1 is contemplated by the Milwaukee Electric Railway & Light Company. In a communication sent to the Railroad Commission the company requests an immediate hearing on an order providing authority to install one-man cars on the Wells-Downer line, considered one of the most important transportation units in the city.

The company's proposal comes in compliance with recommendations made by the Railroad Commission recently in its extensive railway service report, which pointed out the need of increased service on a number of lines. Only partial use, however, would be made of one-man cars on this line, these cars merely providing the extra service recommended in the commission's report. The company plans to use twenty cars of the one-man type on that portion of the line running to the extreme ends, while the regular city cars running between the west city limits and Edgewood Avenue would still be manned by a crew of two men.

In commenting on the latest one-man car application, S. B. Way, president of the company, explained that the move was made in the interest of economy and was designed to demonstrate to patrons that one-man cars are capable of maintaining schedules and giving better service.

Newton D. Baker to Aid Toledo

The aid of Newton D. Baker, former Mayor of Cleveland and Secretary of War in the Wilson World War cabinet, will be sought by the city of Toledo, Ohio, in its efforts to work out a new franchise ordinance based upon the present Milner service-at-cost plan and the reports of Prof. H. E. Riggs, who made a general transit survey last summer. Law Director Frank M. Dotson, who has the responsibility for framing the new plan from the legal side, has secured the consent of Mr. Baker to act. As City Solicitor and as Mayor of Cleveland Mr. Baker had a great deal to do with the solution of the traction problem in that city.

Henry L. Doherty recently asked the city to prepare an ordinance for submission to the company based on the Riggs reports.

Most of the work of drafting the new document will probably be done in Cleveland, but Mr. Baker and Mr. Doherty may both be brought to Toledo for the final conferences on the measure. The hope is to place the plan before the voters at the November election. To do this the grant must be ready 30 days previous to the election date.

New Stone Mountain Cars Attract Riders

The new cars of the Georgia Railway & Power Company, Atlanta, Ga., have proved a real attraction for Sunday afternoon excursionists and for many recreation seekers on week-day evenings. The Stone Mountain line ends within 2 miles of the Stone Mountain memorial, and the Marietta line ends about the same distance from the Kennesaw Mountain battlefield, places of art and historic interest without superiors in the category of the world's places of interest. The rate of fare is moderate, and either trip can be completed in an afternoon.

New Loop Arrangement in Oakland

Franchises have been granted by the city of Oakland, Cal., to the Key System Transit Company in the name of F. W. Frost, secretary of the company, for the building of two loops to facilitate traffic in the downtown section of the city.

The first loop will be at Eighth and Franklin Streets, north to Ninth Street and thence west to Broadway. The second loop will be at Washington and Thirteenth Streets, west to Jefferson Street and south to Twelfth Street.

These loops are authorized as the result of the recent traffic survey made in Oakland by engineers of the railway, the city and the California Railroad Commission. Work on them will be started shortly. Upon completion of the loops, several lines of cars will be rerouted and the rush-hour congestion, which has long been a problem in downtown Oakland, will be greatly relieved, it is declared by officials.

Within two months work will be started on an extension to the Park Boulevard line. About 2,100 ft. of rail

will be laid, the new terminus of the line to be the other side of Dimond Canyon. A bridge over this canyon was recently completed. A new section of East Oakland, now without transportation, will be served by the Park Boulevard line after the extension has been completed.

Birmingham Goes Back to Old Routes

Citizens of West End and East Lake, Birmingham, Ala., won their fight recently against the new downtown routing of the cars of the Birmingham Electric Company when J. M. Jones, president of the City Commission; Hugh White, attorney for the Alabama Public Service Commission, and I. F. McDonald, chief engineer for the Public Service Commission, assured a mass meeting of 500 that the cars would be turned back into the old routes. It was estimated that 100,000 persons in East Lake, Woodlawn, West End and Bessemer were affected by the change in the routing of the cars.

About two months ago the Birmingham Electric Company changed the downtown routes with the permission of the Alabama Public Service Commission, acting on the advice of the City Commission. That body believed at first that the change in the routes would be a safety measure, but Mr. Jones said the try-out had proved otherwise. The new routes, it was stated, worked a hardship on the users of the street cars in that virtually all were forced to walk longer distances to their destinations after leaving the cars.

Chicago Alderman Seeks to Force Commission's Hand

Failure of the Illinois Commerce Commission to pass on a petition filed in 1924 which would permit the Chicago Surface Lines to operate motor coaches as feeders to its railway lines and issue universal transfers was condemned during the week ended July 24 by members of the local transportation committee of the Chicago City Council. One Alderman proposed the circulation of petitions in every section of the city calling upon the commission for immediate action. Both the Chicago Surface Lines and the Chicago Motor Coach Company expressed willingness two years ago to place buses in operation on Diversey Boulevard and other sections of the city without adequate service. The City Council indorsed the surface lines' offer at that time, but the commission has continually deferred action.

New Franchise in Maywood.—By a vote of more than twelve to one citizens of Maywood, Ill., approved a twenty-year franchise to the Chicago & West Towns Railway, Oak Park, Ill., at a referendum held on July 10. The ordinance, previously adopted by the City Council and accepted by the company, provides for a general rehabilitation of the company's lines in Maywood. A new line of double track approximately 1 mile in length will be built on Madison Street. The railway recently installed two new buses, supplementing its car service, with universal transfers.

Recent Bus Developments

Bus Subsidiary of Reading Company to Incorporate

The Public Service Commission has approved the application for a charter for the Reading Transportation Company, a subsidiary of the Reading Company. The charter must be approved by the Governor before it is effective.

This permits incorporation to operate bus lines in the state of Pennsylvania, but application must be made to the commission for each individual route. Application for approval of several of these routes has been made to the commission, but so far no action has been taken by the commission.

The Reading Transportation Company desires to operate buses in territory covered by the parent company's railroad charter, paralleling its lines and running auxiliary service, especially on branch lines where steam service is not paying dividends.

The commission has before it applications from the new company for the right to operate in Schuylkill, Northumberland, Dauphin, Cumberland and Adams Counties. The charter applied for gives the company right to operate in eleven counties, but if this is granted, the commission will act upon each specific route asked for after hearings.

There has been much opposition, particularly on the part of the electric railways, to some of these, especially routes in Schuylkill County and the route between Harrisburg and Gettysburg, which is now covered by the Gettysburg-Harrisburg Transportation Company.

Where there is adequate service, the commission has been loath to grant competitive certificates, and this policy may be followed in the Reading's application. The only other way to obtain the desired routes would then be by purchase.

Fixed Stops for Springfield Buses

Herbert M. Flanders, manager of the Springfield Street Railway, Springfield, Mass., and J. T. B. Woodruff, traffic expert for the city, have mapped out a system of stops for the passenger bus routes of the railway. Much attention has been given to the Orange Street bus route, where it was found too many stops interfered seriously with traffic.

Mr. Flanders wants the company's bus routes regulated as to stops much after the manner of the trolley system. Bus traffic has been growing each year and fewer stops are essential if service is to be expedited. The transportation board is also taking the matter in hand for the general relief of all traffic.

At present bus drivers take up passengers at any place they may be hailed. A system of specific stops, so announced to the public, is expected to correct some of the present evils. Operators will receive explicit instructions not to pick up passengers along railway lines and the rule will be enforced. The

company wants the public to ride in the vehicle of its own choosing, but it believes the public is interested sufficiently in the regulation of the city's traffic to board its chosen vehicle at a designated stopping point.

Purchase of Buses for Substitute Service Approved

Purchase of five safety buses by the Morris County Traction Company, Morristown, N. J., for use on the Elizabeth-Springfield line has been approved by the Public Utilities Commission. Some time ago the company was granted permission to suspend trolley service on this line and substitute buses.

The conditional bill of sale for the buses, sanctioned by the board, mentions a total cost of \$42,796, one-quarter to be paid out of funds in hand on delivery and the balance in 36 equal installments with interest on deferred payments at 6 per cent.

Commission Holds Tulsa-Capital Bus Unnecessary

The Corporation Commission of Oklahoma on July 9 consolidated hearings on the application of the Union Transportation Company for authority to operate through buses between Tulsa and Oklahoma City and of the Red Ball Bus Company to operate between Sapulpa and Tulsa, and after hearing in part the evidence of the former company dismissed both applications. Commissioner Hughes reaffirmed, Chairman Capshaw concurring, the policy of refusing to authorize motor service where adequate service by established lines exists.

The evidence showed that seven trains operated each way daily between Oklahoma City and Tulsa, with hourly interurban service, in addition to steam railway service, between Tulsa and Sapulpa. The application of the Union Transportation Company to operate buses between Sapulpa and Mounds was taken under advisement.

Civic Council Favors Grant to Brooklyn Railroad

The Civic Council of Brooklyn, N. Y., has written to the Mayor in support of the application of the Coney Island & Gravesend Bus Corporation for a bus franchise for Brooklyn. The bus company is affiliated with the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad. In their hands the franchise would be used for buses as feeders for rapid transit lines and for supplemental service for the new population which has settled beyond the reaches of the surface lines.

The Civic Council is opposed to the grant of a city-wide franchise. It fears that a new company would want to establish lines of a competitive nature rather than such as would be to the better advantage of the borough.

Municipal Bus Service in Buffalo Increased

Mayor Schwab has started two additional municipal bus line routes in Buffalo, N. Y. It appears now to be likely that the three lines will continue to operate indefinitely unless they are restrained by the courts. The lines operate over streets which have been designed as parkways. Route No. 2 is in direct competition with the Delaware Avenue-Kenmore line of the International Bus Corporation, a subsidiary of the International Railway. Policemen are acting as guards and conductors for the municipal buses. The City Council has voted an appropriation of \$10,000 to the Department of Public Safety for the initial operating expenses of the new lines. All the buses are single-deck machines equipped with pneumatic tires. They seat from 33 to 35 passengers.

Buses Replace Trolley at Key West

Another little electric railway has passed out of the picture. It is the road at Key West, Fla., 4.08 miles, run as part of the system of the Key West Electric Company. Buses have taken its place in furnishing transportation to the public, and the work of removing the rails is under way. The date on which the road suspended was July 10. The first railway in Key West went into service in 1881. Louis Miguel, who drove the first car in the horse-drawn service and was the first man at the controller when the electric cars were placed in operation, piloted the last car into the carhouse. Since then the nine old trolley cars have been run onto temporary tracks at La Brisa and will be sold for junk. B. L. Groome, manager, says they are not of standard gage, and that open cars are now almost obsolete, so there is no demand for them for use elsewhere.

Midland Utilities Acquires Independent Indiana Bus Line

Withdrawal of one more independent motor bus line from the rapidly-developing industrial district of northwestern Indiana was announced on July 19, when the Midland Utilities Company contracted to purchase the entire equipment and franchises of the Calumet Motor Coach Company, Hammond, Ind. If the affairs of the company are found to be as represented after an audit of its books, the sale will be consummated.

The Midland Utilities Company, through its subsidiary companies, the Chicago, South Shore & South Bend Railroad, Gary Railways and Shore Line Motor Coach Company, is already engaged in the transportation business in this territory on a large scale.

The purchase of the Calumet Company's properties will include 41 buses now furnishing service in Hammond and between Chicago and Hammond and East Chicago and Hammond.

Co-ordination of schedules with those of the other Midland coach lines will result in large operating economies and improvement of service, according to C. W. Chase, president Gary Railways and Shore Line Motor Coach Company.

Bus Line for Hamden, Conn.—The Connecticut Company, New Haven, Conn., has been granted permission to operate a bus route over Dixwell Avenue, Hamden, Conn., with terminals at Whitney Avenue and Putnam Avenue. Some time ago the company was ordered to construct trolley tracks over this section. This order was automatically rescinded when the bus license was granted.

Buses Displace Entire Toledo Line.—Substitution of buses by the Community Traction Company, Toledo, Ohio, on the Front Street line operating a downtown loop will provide the first displacement of an entire trolley line with motor coaches in Toledo. The 24 new buses will start operating on Aug. 1 provided paving operations on Front Street are completed.

P. R. T. Starts Emergency Line.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., began operation recently of a motor bus line between towns in the northeastern section of the city and the Bridge Street terminal of the Frankford elevated on an emergency order from the Public Service Commission. The order was made after a two-day period of isolation of this section, caused when Wilbur F. Menke, who had been operating several bus lines, suspended service. He had been informed that his franchise, expiring on Aug. 31, would not be renewed, and his drivers were leaving him to obtain permanent employment elsewhere.

New Buses in Service.—The Washington Rapid Transit Company, affiliated with the Washington Railway & Electric Company, Washington, D. C., has retired its duplex buses and placed in service six double-deck Fageols of the type in use in Atlanta, Ga. These buses have a closed rear and a top with an awning. The color scheme has been changed and hereafter the vehicles will appear on the streets in a two-tone brown instead of gray and red.

Time for Bus Operation Extended.—An extension of time until Aug. 10, 1926, has been granted by the Railroad Commission to the Pacific Electric Railway, Los Angeles, Cal., for certain bus operation. Within this period the company will begin operation of an auto stage service between Lankershim Boulevard and San Fernando Road in the city of Los Angeles and the Pacific Electric Railway station in the city of Burbank.

Acquires New Line.—The Union Transportation Company, owned and operated in connection with the Oklahoma Union Railway, Tulsa, Okla., announces, through R. V. Miller, general manager, that it has acquired the Gordon-Smith bus line, route 77, between Henryetta and Okemah, and will consolidate this line with its service between Mounds and Henryetta. All service between Okmulgee and Okemah is by way of Henryetta except one round trip leaving Okemah at 9:45 a.m. and arriving at Okmulgee at 11:30 a.m. and leaving Okmulgee at 4 p.m. on the return trip, arriving at Okemah at 5:45 p.m. These buses connect with the interurban line of the Oklahoma Union Railway at its southern terminus at Mounds.

Financial and Corporate

Payments Announced Under Detroit United Bonds

The protective committee acting for the holders of the first mortgage and collateral trust sinking fund five-year 6 per cent bonds of the Detroit United Railway, Detroit, Mich., has issued notice that under a court order the Central Union Trust Company will pay as of Aug. 1 on and after Aug. 2 from funds held as trustee 18½ per cent of the principal amount of bonds presented. Holders of certificates of deposit issued under the bondholders' protective agreement dated No. 2, 1925, are entitled to receive this payment on and after the date specified.

The committee reports progress in negotiations with security holders of subsidiaries for a system reorganization, but say that it is evident no satisfactory reorganization can be effected this summer. They urge holders of undeposited bonds to deposit their securities with the Central Union Trust Company on or before Aug. 14, when the right to make these deposits expires.

Abandonment by Interurban Opposed

At a hearing conducted by the Illinois Commerce Commission at Blue Island, Ill., recently to consider the petition of the Chicago & Interurban Traction Company, Chicago, Ill., to cease operations between Chicago and Kankakee, four witnesses from as many towns along the route appeared in protest. E. E. Rollins, general manager of the Kankakee Electric Railroad, said abandonment would seriously interfere with the operation of the local lines in Kankakee. At the present time the Kankakee lines obtain all power from the Chicago & Interurban company. Severe automobile competition is said by officers of the Chicago & Interurban Traction to have made operation no longer profitable. Further evidence was heard by the commission at Springfield on July 19.

Claims Filed Against Holders of Bonus Stock

Two attempts to enforce liability against stockholders of the old Electric Short Line, Minneapolis, Minn., so that claims of \$100,000 can be paid, were made recently in Hennepin County District Court, in separate suits filed by creditors.

Both actions are based on the theory that holders of common stock in the old company, which for several years has been in the hands of a receiver, are liable even though they received the stock as a bonus. In both cases receivers are asked, although the old company already is in the hands of a receiver.

The suits in no way affect the Minnesota Western Railroad, formed under the reorganization plan, when physical

property of the company was sold to bondholders under foreclosure. Actions are against individual stockholders.

Attorneys seek to recover from all solvent stockholders who can be reached, planning by their actions to raise enough to pay off outstanding claims not disposed of in the federal court receivership.

Committee Contracts to Sell Rockford & Interurban Bonds

T. M. Ellis, Jr., Beloit, Wis., contracted on July 17 to purchase the first mortgage 5 per cent gold bonds of the Rockford & Interurban Railway, Rockford, Ill., on deposit with the committee of which Robert W. Baird is chairman. The consideration is to be paid in cash and is on the basis of 23½ per cent of the face value of the bonds. After the deduction of the expenses of the committee the amount remaining will be distributed among the holders of certificates of deposit. The right of the holder to withdraw his deposit is reserved to him if he acts within a stipulated period.

The announcement just made indicates the consummation of a deal reported before to be pending by which Mr. Ellis, who is president of the Beloit Traction Company, Beloit, Wis., will become actively affiliated with the affairs of the interurban in the effort being made to rehabilitate the road.

More Preferred Stock Offered to Brooklyn Employees

Employees of the Brooklyn-Manhattan Transit System are to have a second opportunity to purchase preferred stock of the B.-M. T. Corporation at a price considerably lower than the present market value and upon terms that will make the final net cost approximately \$55 per share.

This second offer of preferred stock to its employees is made by the B.-M. T. at the suggestion of various committees of employees elected to represent them in the settlement of problems of mutual interest to the employees and management.

The original offer of B.-M. T. preferred stock to employees was made in July, 1924. The stock was selling in the market at that time at approximately \$70 a share. Fifteen thousand shares were offered to employees at \$65 a share and payments were extended over a period of a year. By crediting employees with dividends paid at the rate of \$6 a share a year during the period of payment and charging interest on deferred payments at the rate of only 5 per cent a year, the net cost to employees was approximately \$60.50 a share under the original offer.

Under the 1926 offer, the stock may be purchased by employees for \$75 a share, although the market price at present is \$85 a share. By again crediting employees with dividends as paid

during the period of payment and charging only 5 per cent interest a year on deferred payments as in the first offer, the final cost to employees under the terms of the new offer will be reduced to approximately \$55 a share. Subscriptions under the new offer are limited to twenty shares for each employee with the right reserved to the company to reduce subscriptions and allot shares so every employee may subscribe for and receive at least one share. When the first offer of 15,000 shares was made, subscriptions were received from 10,609 employees for a total of 20,235 shares.

Payments for the stock are to be extended over a period of five years so that employees may secure the stock by paying only \$1 a share a month.

Incidentally it might be mentioned that employees in service on Aug. 1, 1926, who purchased preferred stock under the offer of 1924, will be entitled to a refund or bonus of \$1 a share for each share of stock purchased under the plan and for which they retain ownership of the original certificate of stock issued to them.

Abandonment of Lincoln Line Approved

The Nebraska State Railway Commission has approved the application of the Lincoln Traction Company to abandon service on a short line paralleling the business district and to remove nearly a mile of tracks. The line helped serve the downtown campus of the University of Nebraska. It is the intention of the company later, when it develops its intramural bus lines, to operate buses between the campus and that of the State College of Agriculture, 2½ miles northeast. This bus line will pass through a well settled section of the city. It is expected to develop new business for the company. The commission says that the fact that the average number of passengers carried a day, including transfers, was only eight on the whole line indicates its almost complete abandonment by the public as a means of reaching the university and environs.

\$5,000,000 More Preferred Proposed for P.R.T.

The new financing program of the Philadelphia Rapid Transit Company, Philadelphia, Pa., contemplates the issue of \$5,000,000 of additional preferred stock, as revealed in a communication to City Council by President W. K. Myers.

Of this sum, \$3,272,000 is for normal capital and additional improvements, and the rest to finance new buses and bus lines and garages. The details were sent to Council in conformity with the agreement between the city and the P.R.T. entered into in 1907. The city must give its consent to the financing.

The previous capital of the P.R.T. was \$30,000,000 common stock, and \$3,000,000 preferred, issued recently for the purchase of buses, the purchase of taxicabs and franchises of the Yellow Taxicab Company. The new issue proposed will increase the stock issue of P.R.T.

The statement from the P.R.T. was referred to the committee on transportation and public utilities. An ordinance will be introduced after the recess of Council terminates in September to approve of the new issue.

The city-company 1907 agreement provides that when P.R.T. is desirous of making expenditures chargeable to capital account, it shall advise the city of these expenditures with the estimated cost of same. The additional money is to be spent in 1927 as follows:

Normal capital expenditures for track improvements and extensions, improvements, additions and betterments to car-houses, substations, transmission and distribution system, etc.	\$1,700,000
Retirements of underlying securities, viz.:	
P.R.T. collateral bonds, due 1957	84,225
P.R.T. sinking fund bonds, due 1962	59,970
P.R.T. car terminal mortgage bonds, due 1944	103,000
P.R.T. car trust certificates, D, E, F, G, H and J	1,253,000
Philadelphia & Willow Grove Railway bonds, due 1934	20,000
Union Traction Company bonds, due 1952	27,600
People's Passenger Railway stock trust certificates, due 1943	25,000
Total	\$3,272,795
Down payment on 250 buses	800,000
Motor bus service equipment	150,000
Motor bus garaging	800,000
Total	\$5,022,795

Suit for Receiver for Sharon-New Castle Road

The New York Trust Company, New York, has filed an equity suit in the United States District Court against the Sharon & New Castle Street Railway, New Castle, Pa., to recover interest on \$120,000 first mortgage 5 per cent bonds, issued by the railway in 1901.

The bill of the plaintiff company sets forth that the railway issued 120 first mortgage bonds for \$1,000 each in July, 1901, payable on July 1, 1931, and with interest payable semi-annually on the first days of January and July. It is averred the defendant has failed to pay the installments of interest.

The railway operates 17 miles of track. The securities of the property are all controlled by the Pennsylvania-Ohio Edison or its subsidiaries and the present proceeding is an internal action for readjusting the relations of the companies.

Net Up More than \$670,000 on Brooklyn Property

The statement of the Brooklyn-Manhattan Transit Corporation and affiliated companies, Borough of Brooklyn, New York, shows an increase of \$674,434 in the net income for the twelve months ended June 30 over the similar period last year. The statement follows:

	Year Ended June 30	1926	1925
Total operating revenues...	\$44,840,967	\$43,312,417	
Total operating expenses...	29,220,839	28,426,390	
Net revenue from operation.....	\$15,620,127	\$14,886,026	
Taxes on operating properties.....	3,260,384	3,068,461	
Operating income.....	\$12,359,742	\$11,817,564	
Net non-operating income...	1,180,492	1,084,581	
Gross income.....	\$13,540,235	\$12,902,146	
Total income deduct ons....	7,777,877	7,814,221	
Net income.....	\$5,762,358	\$5,087,925	

Chester Valley Lines Makes Progress in Combined Service

The net income of the West Chester Street Railway and subsidiary corporations, West Chester, Pa., for the year ended Dec. 31, 1925, was \$58,887. This represented a balance applicable to reserves, dividends and surplus. In the annual statement of the Chester Valley Lines, comprising the electric railway and bus lines of the West Chester Street Railway, Charles B. Cooke, Jr., president, said it should be borne in mind that the results were obtained during a period of twelve months, in nine of which bus operation, which yielded more than half of the gross revenues, was burdened with extraordinary costs of operation, since eliminated as a result of consolidating the various bus lines into a unified system on Sept. 27, 1925.

The report goes into detail on the bus expansion. The company acquired control of bus routes in order to establish a unified and profitable service and to eliminate the possibilities of competition. Control of bus routes was completed on Jan. 1, 1925. The only additional route taken over in 1925 was that connecting Pottstown, Spring City and Royersford. With the acquisition of these routes and the Reading-Pottstown Bus Company, the Chester Valley Lines will have a continuous bus route between Norristown and Reading, a distance of 42 miles through a most active section of the Schuylkill Valley. It will also permit of "through" bus service between Reading, Pa., and Wilmington, Del., via Pottstown and West Chester.

As a result of methods used to increase traffic on the bus system substantial increases in revenue were obtained all through the year, these being equivalent to an increase in the business at a rate of about \$100,000 per annum obtained in the first twelve months. New equipment was purchased and new financing was undertaken, with the stockholders authorizing an increase in capitalization of \$250,000 in the form of 7 per cent participating cumulative preferred stock, of which a substantial part has already been sold. In line with modern utility practice, investors in the territory along the company's railway and bus lines are being permitted to purchase this stock.

The report states that while the three years ended Dec. 31, 1925, represented the most notable period in the company's history, considering the growth of assets and earning power, the company's funded debt remained almost stationary.

In addition to its regular service the company has installed a package express service without additional capital outlay and with an almost negligible increase in operating expenses. This service parallels certain of the bus lines and provides store-door delivery to the various communities along those lines. The company is at present negotiating with several large wholesale houses for hauling their merchandise under exclusive contracts, and has completed arrangements for interchange of business with one of the leading express companies covering the Philadelphia and Camden district.

**CONSOLIDATED INCOME ACCOUNT OF
THE WEST CHESTER STREET
RAILWAY AND SUBSIDIARIES,
YEAR ENDED DEC. 31, 1925**

(After Giving Effect to Present Financing)		
Operating revenues.....	\$435,195	
Operating expenses (A).....	344,497	
Operating income.....	\$90,698	
Other income.....	28,869	
Gross income available for bond interest.....	\$119,567	
Ratio to bond interest.....	2	
Interest on bonds:		
First mortgage 5 per cent \$838,000.....	\$41,900	
First lien and collateral trust 6 per cent \$213,000 (B).....	12,780	54,680
Net income.....	\$64,887	
Interest on floating debt.....	6,000	
Net income—balance applicable to reserves, dividends and surplus..	\$58,887	
Dividends \$250,000—7 per cent participating cumulative preferred stock.....	17,500	
Note (A): Includes taxes other than federal income taxes.		
Note (B): Includes interest on 6 per cent bonds in treasury, proceeds from sale of which are to be applied to liquidation of floating debt.		

In view of the extraordinary growth of the company's interest in bus operation, the management deemed it advisable to call on independent consulting engineers to make a report of the company's condition. The purpose of the report was to obtain a reliable, unbiased opinion on the stability of the company's bus development and the reciprocal advantages of increased traffic, as well as a forecast of the financial results that could reasonably be expected from the consolidated system. It was thought the report should give particular attention to its bus systems, since the operating results of the company's railway lines were already firmly established. The report was made by Ford, Bacon & Davis. Extracts were republished in the annual statement of the company.

President Cooke states that a summary of these engineers' estimates would show gross earnings for the year 1930 of the consolidated system amounting to about \$830,000 and net earnings, after deducting operating expenses, maintenance, depreciation and taxes, of about \$218,000. These figures do not give effect to the earnings of the Pottstown-Spring City line, purchased in November, 1925, or of the Reading-Pottstown line, purchased in January, 1926; or to any further extension of the company's operations. Neither do they give effect to any increase of earnings from the operation of the company's package express service, which was only established in February, 1926. However, "the financial results of the company's operations are thus far considerably exceeding the forecast made by Ford, Bacon & Davis, Inc."

More Madison Lines to Be Discontinued

An order has been issued by the Railroad Commission permitting the Madison Railways, Madison, Wis., to discontinue its railway line on Harrison Street, and handle traffic by bus, a service which has already been installed. Railway service on Regent Street has

also been discontinued temporarily until the Regent Street line is connected with the Breese Terrace line. The Harrison tracks will be removed and the street paved by the city. Tracks on Regent Street from Harrison Street to the cemeteries will be left untouched until the company is ready to establish a connecting link on Regent Street between Breese Terrace and Harrison. The commission found that the operation of cars over the Illinois Central bridge on Harrison Street would be unsafe if the track of the railroad were lowered to the grade outlined and demanded by the city in its paving program. Patrons of the Harrison Street line are opposed to the removal of the tracks. They are expected to appeal to the courts for a continuance of railway service.

New Owners to Take Ohio Interurban

Another interurban in the Central West is about to change hands. The Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, will be sold to E. S. Little and associates by an agreement of present security holders, who have assured new owners of at least 75 per cent of the entire outstanding preferred and common stocks.

The agreement of purchase offers the same terms to minority holders as were granted to the large stockholders of the company in the sale. The purchasers have posted \$100,000 as a guarantee and have named the Fourth & Central Trust Company, Cincinnati, as depository for the stocks and bonds of the company.

Under the terms of sale the 7,500 shares of preferred stock are to be purchased at \$72 a share plus accrued dividend, and the 11,250 shares of common at \$52 a share, while the 6 per cent bonds, of which there are \$956,000 outstanding, are to bring 92 per cent of par value. An issue of \$480,000 of Toledo & Findlay Railway 5s will be purchased at 90 per cent of par.

The company operates an interurban line from Toledo to Findlay and does a lighting and heating business in the latter city.

The offer of the purchasers to take up the minority holdings expires on Sept. 1.

Road in Westchester Sold to New York City Line

At public auction on July 19 the Westchester Street Railroad, serving the central section of Westchester County, adjoining New York City on the north, was sold for \$70,000 to the Union Railroad, a subsidiary of the Third Avenue Railway.

Leverett S. Miller, trolley receiver and president of the County Transportation Company as well as president of the New York, Westchester & Boston Railroad, was present at the sale. When the Union Railway's bid reached \$70,000, attorneys for the New Haven Railroad consulted with Mr. Miller and then ceased to bid.

The various lines had been sold separately earlier and they had been purchased by the Union Railway for

\$45,450. The New Haven did not bid at that time, but there were opposition bids from H. C. Salzberg Company, machinery and engineering contractors, of 50 Church Street, Manhattan.

Mr. Davidson's bids at that time for the various lines and property were:

Tarrytown line, \$11,000; Silver Lake line, \$1,750; Mamaroneck line, \$8,700; Scarsdale line, \$4,500; Harrison car-house property, \$9,000, and cars and equipment, \$10,500.

He began to bid for the entire property at \$46,000 and it went rapidly up to the selling point \$1,000 at a time. It had been announced that the various parcels would be sold separately and then altogether, with the highest price taking them.

Although no official announcement was made, representatives of the Westchester Street Railroad indicated that the trolleys would be kept in operation until the purchaser takes them over or some other form of transportation is substituted. The Union Railway is expected to take title in ten days.

The purchaser operates lines under its name in New Rochelle and Mount Vernon. The Third Avenue Railroad operates trolley and bus lines in Yonkers and also a bus line between New York and Rye Beach.

The property that was sold comprises 20 miles of track.

Alfred T. Davidson, Third Avenue Railroad attorney, who conducted its bidding, declined to announce that company's plans, but he intimated that a statement might be forthcoming later.

Financing of Buses for Newark Approved

Execution of \$2,900,000 notes by the Public Service Transportation Company, Newark, N. J., to be used in paying for 333 gas-electric buses has been approved by the Public Utilities Commission.

The buses cost the Public Service Transportation Company \$3,281,202, less a deduction of \$343,300 for 404 second-hand buses turned in.

This developed at a hearing recently before the commission of an application for approval of the issuance of the notes. The cash the transportation company obligated itself to pay after the allowance for the second-hand buses was made was \$2,937,800. Of this \$2,900,000 was advanced by the Public Service Corporation on the proposed note issue and the remaining \$37,800 was taken out of the subsidiaries' general fund.

Testifying for the transportation company, one of its general officers said the \$2,900,000 was to be divided into ten notes, each of \$290,000, one payable on April 1 of each year from 1927 to 1936. They will bear 6 per cent interest and be secured by a chattel mortgage with the 333 machines as security.

Since the two orders were placed, Public Service has placed an order for 21 buses of the gas-electric drive type which will be fitted with special bodies for the de luxe and semi-de luxe lines contemplated between Newark and Plainfield, Hackensack, South Orange and Maplewood and the Forest Hill service.

Personal Items

C. C. Fast Receives New Post at Harrisburg

C. C. Fast, general superintendent of transportation of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, has been appointed general superintendent of the Valley Railways, Harrisburg, Pa., effective July 1.

Mr. Fast has been connected with the Springfield company since Sept. 1, 1905, when he was employed as a conductor. In this capacity he worked for several months during the construction of the Fort Wayne, Van Wert & Lima Traction Company and until the officials of that company were ready for a dispatcher to handle their train operations. The opportunity came in November, 1905, and for two years he dispatched trains so efficiently that he was later made chief dispatcher. He fulfilled the duties of this job until Mr. Dicke's resignation as superintendent of transportation of the line in 1911, when he succeeded Mr. Dicke. Mr. Fast continued in this work until January, 1921. The Ohio Electric Railway then went into the hands of a receiver, and at that time Mr. McClure, the receiver, appointed Mr. Fast general superintendent of transportation. He moved from Lima to Springfield.

Mr. Fast was graduated from the High School in Delphos, Ohio, in 1897. He worked as a telegraph operator for the Pennsylvania Railroad until 1901 and later as a conductor on the lines of the Western Ohio Railway for one year. He was then promoted to the dispatcher's office and worked as a dispatcher until Sept. 1, 1905. It was at that time that Mr. Dicke employed him as a conductor on the Fort Wayne, Van Wert & Lima Traction Company lines until such time as a dispatcher was needed.

H. A. Schiebler with New York Commission

Howard A. Schiebler has been appointed assistant secretary of the New York State Transit Commission. He will fill the position as head of the information bureau, recently vacated by F. N. Robinson, who resigned to become publicity director of the Boy Scouts of America.

Mr. Schiebler brings to his new work seven years experience in the newspaper field, during which he specialized in politics, transit and labor matters. Joining the staff of the *Brooklyn Daily Eagle* in 1919, he was assigned the task, two years later, of handling local politics for that paper. In 1922 he became Albany correspondent for the *Eagle*, covering the activities of the Legislature from that year until June, 1926, a period in which transit matters were much to the fore on Capital Hill.

Mr. Schiebler was born in Brooklyn in 1900 and was graduated from Erasmus Hall in 1918. His grandfather,

George W. Schiebler, a manufacturer of silverware, was a prominent figure in "old New York."

More Appointments Made on Syracuse Lines

Appointment of Floyd Sparrow, instructor, as superintendent of the Tallman division, Syracuse lines of the New York State Railways, and the transfer of J. J. Flood from head of the Tallman division to the superintendency of the Wolf division have been announced by Ernest K. Miles, superintendent of transportation for the Syracuse lines.

Clarence Wombles, inspector, was appointed instructor to succeed Mr. Sparrow and F. S. Curtis, motorman, was promoted to Mr. Wombles' position. These changes are part of a general reorganization of personnel of the lines, due to the death of J. E. Duffy, veteran

transportation superintendent, and the advancement of Mr. Miles to that position.

Receivers Make Plans for Future

Francis M. Wilson, one of the receivers of the Kansas City Railways, Kansas City, Mo., returned to Kansas City recently after conferring with Judge Kimbrough Stone, referee, at St. Paul, Minn., and received a check for \$71,000, the final allowance made to each receiver for his services. Each receiver had previously received \$110,000.

Mr. Wilson has not announced his plans following the termination of his duties with the railway. Fred W. Fleming, co-receiver with Mr. Wilson, said he will sail soon for his sixth trip to Europe, where he expects to remain six weeks.

An insurance company is being organized in Kansas City, with Mr. Fleming as president. The new concern will be ready to operate upon his return from Europe.

Mr. Wilson had been away from his desk a total of only 60 days during the 5½ years of the receivership.

New Officials of Texas Electric Railway

Statement of Recent Changes on 80-Mile Interurban with Biographies of Officials in Important Executive Posts

IN CONNECTION with the changes in the personnel of the Texas Electric Railway, Dallas, Tex., the organization of officials has been announced with the exception of the office of treasurer. This position will probably not be filled until next September. As noted previously in the *ELECTRIC RAILWAY JOURNAL*, Burr Martin retired as vice-president and general manager and J. P. Griffin was given the title of active vice-president in charge of all operations. The roster of officials as now announced follows:

C. F. McAuliff, M. J. Loftus, H. G. Floyd, John R. Self, Walter Silvus, G. H. Peters, Mike R. Fewell, D. W. Milam, Jr., and John A. Hiett. Three of the above-mentioned gentlemen, Messrs. Loftus, Floyd and Silvus, continue in their present positions from the previous administrations. These appointees and their positions were mentioned briefly in the *ELECTRIC RAILWAY JOURNAL*, issue of June 5, page 996, at which time the career of Mr. Griffin was reviewed.

C. F. McAuliff, purchasing agent of the Texas Electric Railway for the past seven years, has been promoted to the position of assistant to the vice-president in charge of operation. He has also been elected assistant secretary of both the executive committee and the board of directors. He will continue as purchasing agent of the company, consolidating the offices.

He was first employed by the New York Central Railroad in the maintenance of way department on the Hudson River division, with headquarters at Poughkeepsie, N. Y. In 1912 he was transferred to New York City, in the Madison Avenue office of the New York

Central Railroad, in connection with the construction of the Grand Central Terminal and the Biltmore Hotel. On the completion of this work Mr. McAuliff went to Dallas, where the interurban service from Dallas to Waco was being started. Joining the Texas Electric in February, 1913, he has been with it continuously for the past twelve years, with the exception of the year 1918, when he was in the 868th Aero Squadron of the U. S. Aviation Corps.

He was born in Peekskill, N. Y., in 1892. He was graduated from the public school and Morrill Hall Military Academy in 1910.

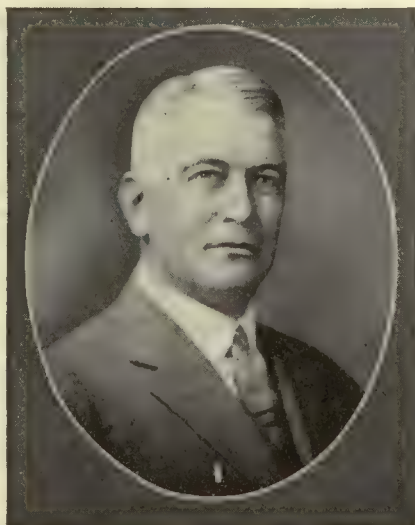
M. J. Loftus has been retained as superintendent of the Dallas-Denison division of the Texas Electric Railway, in charge of transportation, overhead and roadway. He went to Dallas in 1908 to become superintendent of the Texas Traction Company, then under construction between Dallas and Sherman, starting operation of this line in July, 1908. He also started the operation for the Southern Traction Company of the Dallas-Corsicana and Dallas-Waco divisions in 1913.

His first experience with electric lines was in Wheeling, W. Va., in 1889. Before going to Texas he had considerable experience in both construction and operation of city and interurban railways with the following properties: Duquesne Traction Company, Pittsburgh; Allegheny & Manchester Traction Company, Coney Island & Brooklyn Railroad, Wheeling & Elm Grove Railroad, Indianapolis & Martinsville Rapid Transit, the Appleyard Systems of Ohio and the Ohio Electric Railway.

Mr. Loftus was born in Wheeling, W. Va., in 1874.

H. G. Floyd has been retained as superintendent of the transportation, roadway and line departments. He has been with the Texas Electric Railway since 1912, when the Dallas-Waco division was acquired by the late Col. J. F. Strickland. Mr. Floyd's divisions are from Dallas to Corsicana and Dallas to Waco, with city lines at Corsicana and Waxahachie.

In 1910 he began his electric railway career with the Louisville & Eastern Railway as trainman and train dispatcher, leaving in 1912 to join the Dallas Southern Traction Company. In 1915 Mr. Floyd was appointed superintendent of transportation on the Dallas-Waco division, and in 1916 accepted a similar position with the Dallas-Corsicana division, merging the two offices. Four years later he was placed in charge of three departments, trans-



Ohio Railroad in its shops at Zanesville, Ohio, in 1893. In 1903, when he left, he had advanced to the position of general car shop foreman at Garrett, Ind. In 1904 he was with the Elgin, Joliet & Eastern Railroad at Chicago as foreman of its car shops, leaving a year later to go with the Twin City lines at Minneapolis and St. Paul, where he stayed for five years as inspector and shop foreman. In 1909 he left the Twin City lines to accept a master mechanic's position with the Chicago, North Shore & Milwaukee Railroad at Highwood, Ill. In 1910 he was made superintendent of equipment of the Michigan United Traction Company at Albion, Mich., where he stayed until 1912, when he again joined the Twin City lines.

Mr. Silvus was born in Washington County, Ohio. He completed a short college course.



New Officers Texas Electric Railway

1. JAMES P. GRIFFIN, Vice-president
2. JOHN R. SELF, Superintendent Waco City Lines
3. C. F. MCAULIFF, Assistant to Vice-President in Charge of Operation and also Purchasing Agent
4. H. G. FLOYD, Superintendent Waco & Corsicana Divisions
5. WALTER SILVUS, Superintendent Equipment
6. M. J. LOFTUS, Superintendent
7. JOHN A. HIETT, General Claim Agent
8. GEORGE H. PETERS, Superintendent of Power
9. D. W. MILAM, JR., Auditor
10. M. R. FEWELL, General Passenger Agent

Born in Calb County, Tennessee, in 1884, he moved to Texas in 1892, residing with his parents on a Collin County farm.

Walter Silvus has been retained as superintendent of equipment. This position he has held since March 1, 1913, when he resigned his position with the Twin City lines at St. Paul to join the new interurban system in North Texas, now known as the Texas Electric Railway.

He began work with the Baltimore &

G. H. Peters, for the past five years assistant to the electrical engineer, has been promoted to superintendent of power, in charge of the power and substation departments.

Mr. Peters began his railway career with the Mobile Light & Railway in 1906, with headquarters at Mobile, Ala. In 1909 he returned to Waco, entering the service of the Waco city street railway lines, then known as the Citizens' Railway. When the Texas Power & Light Company took over the Waco city power franchise Mr. Peters joined the Texas Power & Light Company, remaining with it in the transmission and power departments, being located at Waco, Hillsboro and Dallas, until 1920. In that year he was secured by the Texas Electric Railway. Mr. Peters was born in Waco, Tex.

Mike R. Fewell has been promoted to general passenger agent. He was appointed assistant general passenger agent of the Texas Traction Company, with headquarters at Denison, June 28, 1909. On Aug. 1, 1913, he was made assistant general passenger agent of

portation, roadway and line, on these divisions.

Born in Oakland, Ky., in 1888, Mr. Floyd, after leaving the public schools and Vanderbilt Training School, started with the Southern & Adams Express Company at Louisville, Ky., in 1908, leaving there a year later to go with the Southern Railway at Princeton, Ind.

John R. Self, assistant superintendent of the Denison division of the Texas Electric Railway, has been appointed superintendent of the company's Waco city lines, with headquarters at Waco, Tex. Mr. Self is a veteran of nineteen years service with Texas Electric Railway. He joined the company in 1907, during the time the interurban was being built from Dallas to Sherman by the late Colonel Strickland. Starting in the maintenance of way department of the Texas Electric Railway in 1907, Mr. Self was transferred to the mechanical department, the line department and the transportation department, at three-year intervals, and in 1923 he was appointed assistant superintendent of the Denison division.

the Texas Traction Company and Southern Traction Company, with headquarters in Dallas. In 1917 the Texas Traction Company and Southern Traction Company were consolidated and Mr. Fewell retained the title of assistant general passenger agent with the Texas Electric Railway. Ten years prior to his connection with the Interurban he was in the drug business at Denison, Bonham and Paris, Tex.

Mr. Fewell was born Jan. 24, 1882, at Bonham, Tex.

W. D. Milam, Jr., has been promoted to the position of auditor, and has also been elected assistant treasurer of the company.

He took his first position with the Arkansas Trust Company at Hot Springs, being employed in the accounting department. In 1913 he joined the Texas Electric Railway at Dallas as bookkeeper, and has advanced through different positions in the accounting department, serving as assistant auditor for the last seven years.

In 1917 Mr. Milam obtained a leave of absence and entered the United States officers' training camp at Leon Springs, Tex., and served as lieutenant with Motor Transport Company 365 of the Seventh Division in overseas service with the American Expeditionary forces for two years.

Mr. Milam was born in Dallas, Tex. He attended the University of Arkansas, at Fayetteville.

John A. Hiatt, senior claim agent for the past nine years, has been appointed general claim agent for the Texas Electric Railway.

In 1914 Mr. Hiatt entered the employ of the Northern Texas Traction Company as claim agent on its interurban line between Dallas and Fort Worth, leaving this position to join the Texas Electric Railway.

Born in 1873 in Wood County, Texas, Mr. Hiatt spent his boyhood and early manhood on his father's Texas farm. Having moved to Tarrant County, Texas, in 1906, he was elected County Commissioner, holding this public office for four consecutive years, all of which time he was chairman of the court. From 1910 to 1912 he was general supervisor of road building in Tarrant County, leaving this office to enter the real estate business in Dallas, Tex.

DeBerard Joins Chicago Regional Planning Association

W. W. DeBerard, Western editor *Engineering News-Record*, a McGraw-Hill publication, has been granted a leave of absence to become chief engineer of the Chicago Regional Planning Association.

The association is a corporation not for profit, the principal purpose of which is to co-ordinate the construction activities of the many authorities now planning and carrying out public and private works projects, so that orderly and connected systems of highways, sewers, parks and other public and private works may be developed. This is being accomplished through joint agreement of these authorities in committees on each of the twelve major subjects being studied. Progress and special reports are issued as needed for public educa-

tion. Ultimately these reports may be assembled into a master volume covering the entire regional project.

Mr. DeBerard has been connected with *Engineering News-Record*, and its predecessor, *Engineering Record*, since 1910, all of that time in charge of the Chicago editorial office. He was graduated from Massachusetts Institute of Technology in 1901 and from that time until 1910 was engaged in engineering work, mainly on water and sewer projects.

A. E. Reynolds Heads Midwest Body

Executive of Springfield Utility and Former Easterner in Important Association Post

Once more in his long and successful career in electric railway and public service management Albert E. Reynolds, vice-president and general manager of the Springfield Traction Com-



A. E. Reynolds

pany and Springfield Gas & Electric Company, Springfield, Mo., is honored—this time by election to the presidency of the Midwest Electric Railway Association. For the past year Mr. Reynolds has been vice-president of that organization and in his activities in the public utility field has served also as third vice-president and chairman of the executive committee of the Missouri Association of Public Utilities, member of the executive committee of the Midwest Division of the National Electric Light Association, committee member of the American Gas Association and of the American Electric Railway Association.

Although an Easterner who has lived in Springfield only about three years, Mr. Reynolds has already become a big factor in all the plans for betterment of the city. In each of the localities where he has worked he has identified himself with activities intended to promote the public good. He has the gift of promoting good feeling toward and interest in the projects under his management.

Mr. Reynolds went to Springfield in 1923 as vice-president and general manager of both the Springfield Traction Company and the Springfield Gas & Electric Company, under Sanderson

& Porter, New York, a firm of engineers which operates public utilities in various cities of the United States.

For about seven years previous to his appointment to the Missouri property Mr. Reynolds had been general manager of the United Traction Company and the Hudson Valley Railway, having offices in Albany, N. Y., and had under his direction on the operating side all the electric railway lines in and about Albany.

As a young man, Mr. Reynolds assisted in the construction and operation of the Plattsburg Traction Company, Plattsburg, N. Y., then owned and operated by Sanderson & Porter, the firm to which he returned after eleven years. He remained with the traction company as manager, after its purchase by the Delaware & Hudson Company, until 1909, when he was transferred to Glens Falls, N. Y., as general manager of the Hudson Valley Railway. That company had unwittingly incurred the enmity of some of the people along the line and the system was in poor physical condition, but Mr. Reynolds was able in a short time to correct that unfortunate state of affairs.

A short time ago Mr. Reynolds figured as the subject of one of a series of sketches by Wallace McDougal, in a Springfield paper, of public-spirited men of that city. Mr. Reynolds was shown in characteristic activities—controlling the light and power of the municipality, swinging a golf club, and symbolically indicating his interest in the local fraternal, civic and commercial life and in the Boy Scouts. This sketch showed unerring appreciation of the man as a man and as an executive.

Changes on Fox River Property

John W. Gunderson, for many years division superintendent of the Aurora, Elgin & Fox River Electric Company in Elgin, Ill., has been appointed general manager of the company, succeeding J. F. Egolf, Aurora, whose appointment as assistant to the vice-president of the Chicago Rapid Transit Company was referred to recently in the *ELECTRIC RAILWAY JOURNAL*.

At the same time announcement was made of the appointment of J. C. Johnson, Aurora, as general superintendent of the Aurora, Elgin & Fox River concern. Mr. Johnson for several years has been division superintendent in Aurora and under the new plan will be superintendent of both branches.

Walter S. Van Sickle has been appointed assistant general manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., in charge of operations in 22 municipalities as supervisor of the plants of the Mississippi Valley Power Company.

Charles T. Rowland, who has been in the employ of the Arkansas Central Power Company, Little Rock, Ark., has resigned as claim agent to become secretary-treasurer and manager of the Commonwealth Finance Company and Industrial Loan Bank, both of Little Rock. Mr. Rowland has been claim agent for the Little Rock property since June, 1919.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Bids Wanted on 150 Cars

City of Philadelphia Is Now Ready to Order Cars for the Broad Street Subway—Thorough Study of Equipment Has Been Made

Director of City Transit Henry E. Ehlers advertised on July 16 for bids to be received Aug. 27 for furnishing and delivering 150 steel passenger cars for the Broad Street subway in Philadelphia. These cars will be considerably wider and of greater carrying capacity than the units now in use on the Market Street subway and Frankford elevated. The new equipment will have a seating capacity of 75 passengers and a total capacity of 212, these figures being compared with 51 and 152 respectively, the capacities of the rapid transit equipment now used by the Philadelphia Rapid Transit Company. The specifications, as advertised by Mr. Ehlers in behalf of the city, call for deliveries to begin not later than May 1, 1927, these to continue at the rate of not less than 25 a month, so that all deliveries will be completed not later than Oct. 31, 1927.

In passenger-carrying capacity and in general dimensions the prospective cars will be somewhat similar to those now in operation on the lines of the Brooklyn-Manhattan Transit Company, in New York, and on the Cambridge division of the Boston Elevated Company. They will of course be of all-steel construction, 67½ ft. long, 10 ft. wide and 12 ft. 3 in. high from rail to top of roof. As a preliminary to the development of the design the city transit authorities made a thorough canvass of the types and general arrangements and details of cars in use on other subway and elevated systems, railroads and street railways, with a view to incorporating, so far as possible, the best features of all cars studied and the latest developments in the art.

The maximum convenience of the car rider in the matter of seat comfort, the arrangement and freedom of entrance and exit, the safety of the passenger and operating crew, the utilization of the total carrying capacity of the subway tube, together with the effects of these various elements upon the costs of investment and operation, were stressed by the Department of City Transit.

Three sets of double-leaf doors are to be provided on each side of the car, the door openings being located so that each opening is conveniently accessible to one-third of the passengers. Doors are to be provided at each end of the car to enable movement from one car to the other.

Side doors will be opened and closed by pneumatic equipment electrically controlled from one of the cars. Automatic signal lights are provided for

on the side of each car, in the roof and also in each motorman's cab to indicate whether the doors are in the opened or closed position.

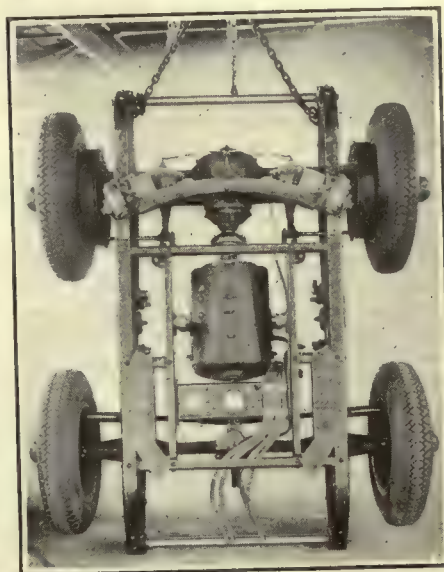
There are 75 seats shown on the car plan, of which number 25 are longitudinal seats on either side of the main doors. The seats will be of the stationary spring cushion type, covered with rattan. Hand grabs on the end of the cross seats, hand straps suspended from the car roof in front of the longitudinal seats, and pipe stanchions located in front of the door openings will be provided.

In addition to the regular system of overhead lights, emergency lights will be placed in the ceiling of the car at all of the doors, which will receive their current from a storage battery and will be automatically lighted whenever the power is cut off.

Flexible Eight-Wheel Coach Now on the Market

Railway men who attended the Atlantic City convention last October will remember the exhibit made there by the Versare Coach Company of Albany, N. Y., showing the first eight-wheel bus ever to be developed in this country. But, as is always the case with pioneer developments, the first bus of this type was rough in appearance and lacked many of the refinements necessary to esthetic design and efficient operation. Since that time the Versare company has made many improvements in the design, the general specifications of which are shown in an accompanying table.

The flexibility with which this 35-ft. 6-in. coach may be handled in crowded traffic lanes is said to be remarkable. Because it turns upon two swiveled bogie trucks, in much the same fashion

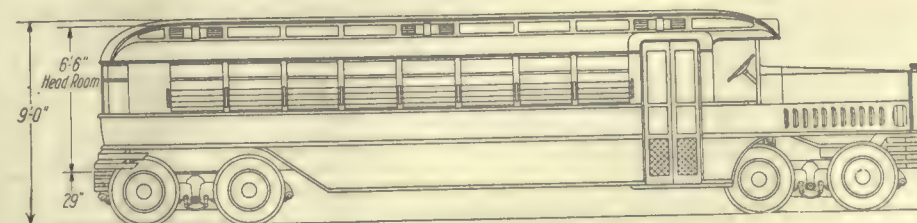
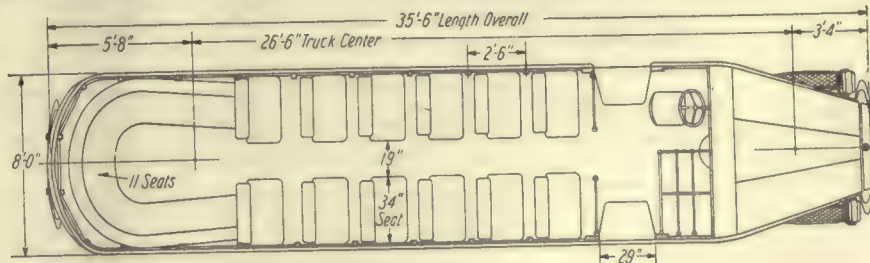


One of the Versare Bogie Trucks, Showing Motor Suspension and Air Brakes

as a railway car, it can be turned in a space of 40 ft. Steering the coach is simple as the steering apparatus has been delicately balanced and the rear truck automatically follows the front truck in making turns.

The light weight of the large body is due to the use of various aluminum alloys in the construction of the frame and of pure aluminum in the sheathing. The highly stressed castings of the body truss are of special aluminum alloy No. 195, heat treated. The non-stressed castings are of No. 43 silicon alloy. The more important structural members are of duralumin alloy No. 17S,

Passenger capacity	...35 seated, 37 standing
Total approximate weight	.....18,000 lb.
Total wheelbase	.....26 ft. 6 in.
Bogie wheelbase	.....4 ft. 6 in.
Length over all	.....35 ft. 6 in.
Width over all	.....8 ft.
Height over all	.....9 ft.
Track	.....69 in.
Interior height	.....6 ft. 6 in.
Height of steps	.....13½ in. and 14½ in.
Width of doors	.....29 in.
Normal speed	.....30 m.p.h.
Engine rating	.....120 hp. at 2,000 r.p.m.
Generator rating, continuous	.....40 kw.
Motor rating, nominal	.....28 hp. each
Number of motors	.....2
Diameter of turning circle	.....40 ft.
Tire size	.....35x7 N.S. cord
Gear ratio	.....10.5 to 1



Seating Arrangement and Side Elevation of Versare Coach Bought by Chicago & Alton Railroad

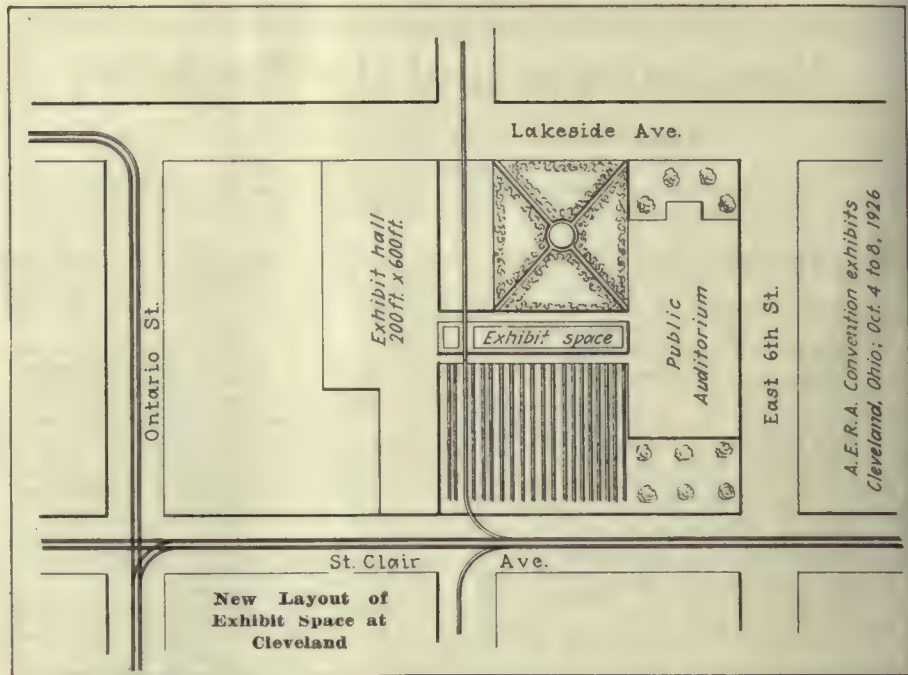
an alloy which is both wrought and heat-treated.

A 120-hp., six-cylinder engine recently developed by the Waukesha Engine Company has been provided as standard equipment on the new units. The engine is connected to a 40-kw. Westinghouse generator by means of a disk-type coupling and the two are mounted as a unit on a sub-frame. The generator, with a continuous rating of 40 kw. at 1,200 r.p.m., is a specially designed machine provided with a field winding arranged for separate excitation, which assures a positive pick-up and stable operation under all load conditions.

The generator is capable of utilizing the full output of the engine and is able, without overheating, to supply full power to two Westinghouse traction motors which are mounted on the bogies. The motors are of the vehicle type and have a nominal rating of 28 hp. at 175 volts. They are so constructed as to protect the commutator against dirt and water, two conditions always encountered under a road vehicle.

Control of the coach is effected through the main controller and the braking controller. The main controller has three operating positions, series and parallel, forward, and parallel reverse. The parallel position forward is the first operating position from the "off," as it is used more frequently than the series. In operating the coach the driver first starts the engine and then throws the controller into one of the operating positions. The engine throttle is practically the only control regularly used, the variations in engine speeds being sufficient to produce the desired voltages. A field resistor unit which is provided is used only in climbing very steep hills or under abnormal load conditions.

An advantage of the Versare coach is that the trucks are removable. Thus any electrical or braking troubles may be corrected without putting the entire unit into the shop. All that is necessary is to run a spare truck under the body and repair the one taken out of service at leisure. The Versare company is also building a six-wheel unit, which is similar in its major points to the larger coach, although of necessity the arrangement of trucks and motors has been altered somewhat.



Space Assigned for Exhibits

One Hundred and Seven Thousand, Six Hundred and Thirty Square Feet Has Been Allotted Exclusive of Track Space for the Cleveland Convention Oct. 4-8—All Arrangements Well in Hand

PLANS for the Cleveland convention of the American Electric Railway Association are progressing with dispatch. The various committees in charge of convention arrangements have details well in hand. The demand for exhibit space has exceeded all expectations, as may be gathered from the fact that when the exhibit committee met to make the official space assignments, it had in hand applications from 195 members. When the assignments were completed, a total of 107,630 sq.ft. had been allotted exclusive of track space.

When the 1925 convention opened last October there were 204 exhibitors who occupied 100,030 sq.ft. of space with a display of equipment that totaled in value approximately \$1,750,000. Almost three months still remain before the 1926 convention opens. Past experience has shown that space applications keep coming in to associa-

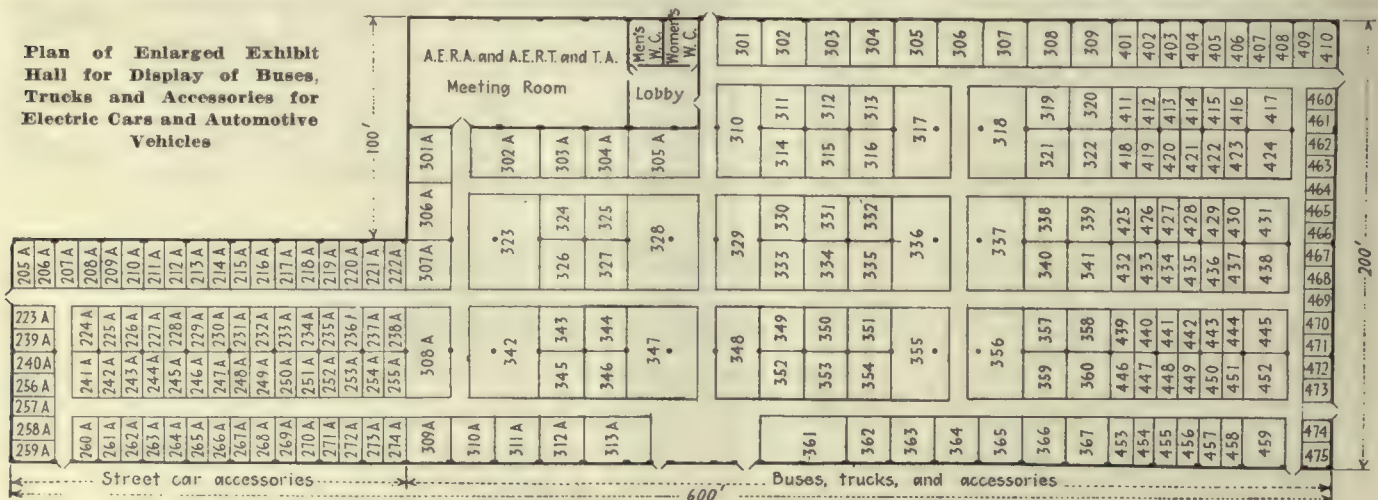
tion headquarters all through the summer, and there are even some concerns which postpone the filing of applications until a day or so prior to the opening of the convention. Needless to say, these, if they can be cared for at all, are necessarily placed in odd corners, or wherever it may be possible to put them, without interfering with fire department rules and regulations.

There are, of course, instances where sales managers have questioned the value of exhibits. The following tabulation will be of interest in this connection as will also the list of exhibitors to whom space has been assigned for this year, many of whom have exhibited consistently at A.E.R.A. conventions for years back.

The following members have applied for track space upon which to show cars:

The J. G. Brill Company.
Cleveland Railway Company.
Cummings Car & Coach Company.

Plan of Enlarged Exhibit Hall for Display of Buses, Trucks and Accessories for Electric Cars and Automotive Vehicles



List of Exhibitors and Space Assigned, A.E.R.A. Convention, Cleveland, October 4-8

Name	Booth Number	Name	Booth Number
Adams & Westlake Company, The.....	405	Johnston, R. F., Paint Company.....	137, 139
Alumino-Thermic Corporation.....	250-A	Karpen, S., & Brothers.....	340
Aluminum Company of America.....	126	Kellogg Manufacturing Company.....	358
American Brake Shoe & Foundry Company.....	274, 275, 287, 288		
American Brass Company, The.....	1 of 206	Lang Body Company, The.....	337
American Brown Boveri Electric Corporation.....	214, 215, 227, 228	Leece-Neville Company, The.....	455
American Car & Foundry Company.....	131, 133, 135, 147, 149 and Corridor	Lorain Steel Company, The.....	242, 243, 255, 256, 257
American Car & Foundry Motors Company.....	323, 324, 325, 326, 327, 328	Lovejoy Manufacturing Company.....	309
American Malleable Castings Association.....	459		
American Steel & Wire Company.....	253, 254	MacDonald Manufacturing Company.....	257-A
Anaconda Copper Mining Company.....	1 of 206	Mack-International Motor Truck Company.....	1 of 331, 332, 1 of 334, 335
Anderson, Albert & J. M., Manufacturing Company.....	232	Mack Motor Truck Company.....	330, 1 of 331, 333, 1 of 334
Associated Spicer Companies.....	437, 438	Mack Trucks, Inc.....	336
Association of Manufacturers of Chilled Car Wheels.....	298	Manganese Steel Forge Company.....	124
		Manley Manufacturing Company, The.....	441, 448
Bacon Safety Fender Company.....	411, 418	Martindale Electric Company.....	223-A
Baker-Raulang Company, The.....	304-A, 305-A	Metal & Thermit Corporation.....	264, 265, 251
Baldwin Locomotive Works.....	216-A, 217-A	More-Jones Brass & Metal Company.....	261, 262
Bender Body Company.....	301, 302, 303	Motor Improvements, Inc.....	420
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FIGURES ON REGISTRATION AND EXHIBIT SPACE SOLD 1916-1926

Year	City	Total Registration	Number of Exhibitors	Total Space Sold, Square Feet
1916.....	Atlantic City	3,271	125	57,329
1917.....	New York City	Conference only	No exhibit	No exhibit
1918.....	New York City	Conference only	No exhibit	No exhibit
1919.....	Atlantic City	3,166	157	62,219
1920.....	Atlantic City	3,300	136	59,529
1921.....	Atlantic City	1,189	No exhibit	No exhibit
1922.....	Chicago	4,200	141	61,895
1923.....	Atlantic City	4,404	163	75,681
1924.....	Atlantic City	5,804	192	86,349
1925.....	Atlantic City	7,147	204	100,030
1926.....	Cleveland	.....	195-7/8/26	107,630 (assigned July 8, 1926)

The Differential Steel Car Company.
Northern Ohio Power and Light Company.
The Phoenix Ice Machine Company.
St. Louis Car Company.

The companies shown below have also made application for track space upon which to show actual working displays of their several products:

Electric Railway Improvement Company.
Ingersoll-Rand Company.
Metal & Thermite Corporation.
Railway Track-Work Company.

Paving Brick Shipments Increase

Increases in production, shipments and unfilled orders, with a corresponding decline in stock on hand, are reported by the paying brick industry to the United States Department of Commerce for June as compared with May.

Production went from 21,103,000 in May to 26,342,000 in June. Shipments went from 22,645,000 in May to 30,312,000 in June. Stock fell from 123,808,000 in May to 115,971,000 in June. Unfilled orders climbed from 71,430,000 the first day of May to 75,283,000 the first day of June.

These figures are compiled from the reports of 26 companies, representing 76 per cent of the normal tonnage of the industry. Ohio leads the list in consumption for June with 8,685,000. Kansas was next with 3,700,000, Texas third with 3,198,000 and Illinois fourth with 2,446,000.

Railroads Order More Gas-Electric Cars

Additional railroad companies, including one in Canada, have placed orders for Brill-Westinghouse gas-electric cars, according to an announcement made recently. One of the railroads, the Reading Company, is placing its second order for this type of car, having already placed in operation the first Brill-Westinghouse car ever built. It was delivered and put in operation in August of last year. The other orders received were from the Wheeling & Lake Erie Railroad and the Temiskaming & Northern Ontario Railroad.

The Reading Company's order calls for three standard designed 60-ft. passenger and baggage cars with the standard 250-hp. gas-electric generator units and all the other construction features embodied in previously delivered cars. When completed and delivered to the railroad these cars will be operated in the service between Trenton and Bound Brook, N. J., it was announced. The order received from the Canadian railroad calls for one 73-ft. passenger and baggage car which is to be delivered at the road's headquarters at North Bay, Ont. The contract placed by the Wheeling & Lake

Erie Railroad calls for two 60-ft. passenger and mail cars and one 60-ft. passenger and baggage gas-electric car.

As in the past all the cars will be assembled at the Brill Works, while the motive equipment will be furnished by the South Philadelphia and East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company.

Yellow Will Build Twin City Buses

Seven gas-electric buses have been ordered by the Minneapolis Street Railway for operation of its first auxiliary service southward from the city center to the outskirts. The service will begin early in September. The buses will be built by the Yellow Truck & Coach Manufacturing Company, Chicago and the bodies by Eckland Brothers Company, Minneapolis, and will cost \$12,500 each. The route is a zigzag course to 24th Street, to Hennepin Avenue, thence to 36th Street and will accommodate passengers who want faster and more direct service and to points not reached directly by trolley lines.

Track and Line

Chicago Surface Lines, Chicago, Ill., has constructed nearly a mile of track on Ashland Avenue between 89th and 95th Streets, Chicago. The work was begun early last spring and service was started over the extension on July 6. The Ashland Avenue line formerly ended at 87th Street. Last year it was extended to 88th Street.

Scranton Railway, Scranton, Pa., will spend approximately \$225,000 in rebuilding tracks and in general improvement to roadways during the current year. Just recently the work of relaying 2,000 ft. of new track on the Bellevue line was completed at a cost of \$20,000. The company is placing 3,600

Metal, Coal and Material Prices

Metals—New York		July 20, 1926
Copper, electrolytic, cents per lb.....		14.25
Copper wire, cents per lb.....		16.00
Lead, cents per lb.....		8.50
Zinc, cents per lb.....		7.475
Tin, Straits, cents per lb.....		63.375

Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....	\$4.35
Somerset mine run, Boston, net tons.....	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons..	1.50
Kansas screenings, Kansas City, net tons	2.475

Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....	\$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago net prices, without bags	2.10
Lined oil (5-bbl. lots), N. Y., cents per lb.	12.4
White lead in oil (100-lb. keg), N. Y., cents per lb.....	15.50
Turpentine (bbl. lots), N. Y., per gal.....	\$0.88

ft. of double track starting at the city line and running 3,600 ft. south into Taylor Borough. The estimated cost of this work is \$88,000. The company has arranged for the rebuilding of $\frac{1}{2}$ mile of single track in Blakely Borough at a cost of \$35,000. Work is being rushed on the placing of 2,500 ft. of single track on Cedar Avenue. This work will entail an expenditure of \$28,000. New track will also be placed on Hemlock Street costing \$700. The building program also calls for the construction of new double track on Pittston Avenue, at a cost of \$55,000. Another improvement to the Pittston Avenue route will be the laying of 2,000 ft. of new track, at a cost of \$20,000. In addition to these jobs the company will spend considerable money for maintenance work.

Wisconsin Gas & Electric Company, Kenosha, Wis., has been asked by the Common Council to improve its system. The recommendations include the extension of one line, the building of two single-track lines and the double tracking of three lines.

New Advertising Literature

Laclede-Christy Clay Products Company, St. Louis, Mo., in a combination letter and catalog folder, says there are at least 3,000 users, "large and small, in every part of the world," of the Laclede fire brick. The names of about half a dozen each of automobile, glass and iron and steel manufacturers, railroads and oil producers and refiners are given as examples of the varied lines of businesses that use the fire brick. In addition two or three laudatory letters are quoted. Five different bricks are specified, manufactured by two different methods, and designed to withstand different conditions of service.

Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has just published a very interesting little book entitled "Industry's Electrical Progress." The author undertakes to prove that the competitive advantages which electric power brings to industry lie in the effectiveness with which electricity is utilized. From this it is a natural sequence to discuss progress which has been made in electric control equipment, and many examples are given of the manner in which proper control equipment has been applied to devious fields of operation. Many photographs of actual installations are shown. The Cutler-Hammer company will be glad to send free a copy to any one requesting it.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently announced the release of publication M.A.C. 7379, which treats clearly the subject of the application of motors and their control for heating and ventilating of modern buildings. This 25-page publication contains nine full pictorial pages showing office buildings, hotels, clubs, lodges, schools, theaters, railway terminals and tunnels. A complete discussion of the types of fans and the type of motors available for fan drive, types of control and distinctive characteristics of motors and control, with illustrations of equipment, and two pages of engineering data complete this circular.



Make light-weight cars safe with modern hand brakes!

To provide greater safety for equipment and for passengers is a vital part of modern car design. For this reason specifications of most of the prominent and progressive railways contain Peacock Staffless Brakes.



A typical modern, light-weight safety car equipped with a Peacock Staffless Brake is that of the Brooklyn City Railroad shown above.

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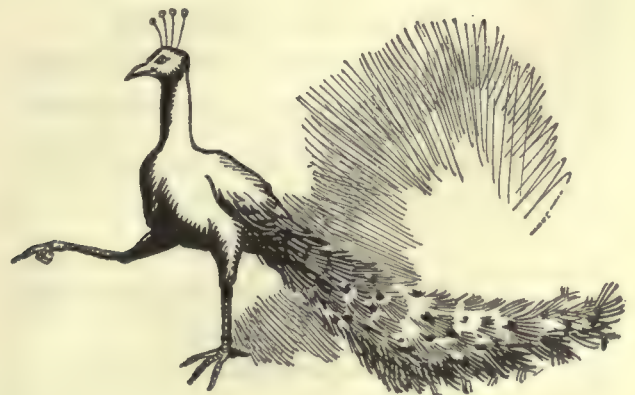
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juries. It thus insures virtually double the carcass life of the tire.

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They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

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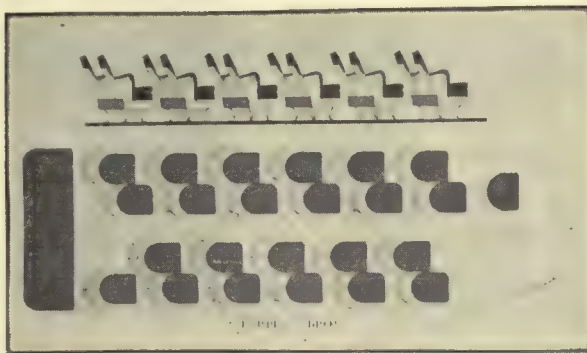
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That extra room, increased comfort and privacy, that wider aisle that you have been wanting; -- you can have all these things now, and without sacrificing seats or revenue. Karpen has solved a difficult problem with a distinctly new type of seat. Out of thirty odd years of experience in building parlor, dining and club car seats for the finest railroad service and a careful study of the bus operator's problems came the Karpen "Staggard" double chair. The overlap of the passengers' shoulders gives perfect freedom from crowding, the chief cause of discomfort in ordinary double seats. Notice

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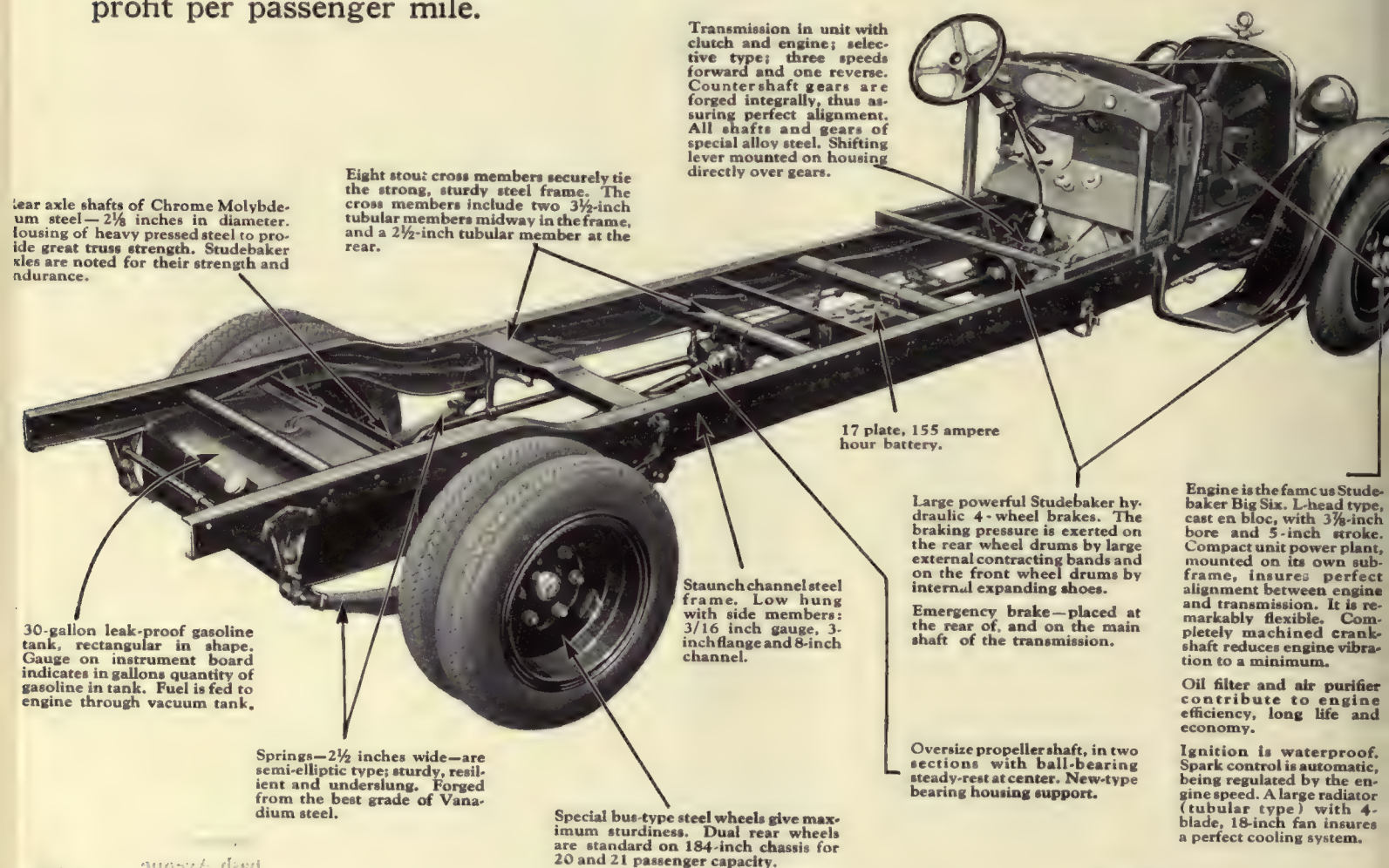
Proved by 100 Million

This aggregate mileage of over 2000 Studebaker Busses proves the Dependability and Economy of Studebaker equipment

IN the total of 100 million miles that 2000 Studebaker Busses have been driven, there is convincing proof of Studebaker stamina and dependability.

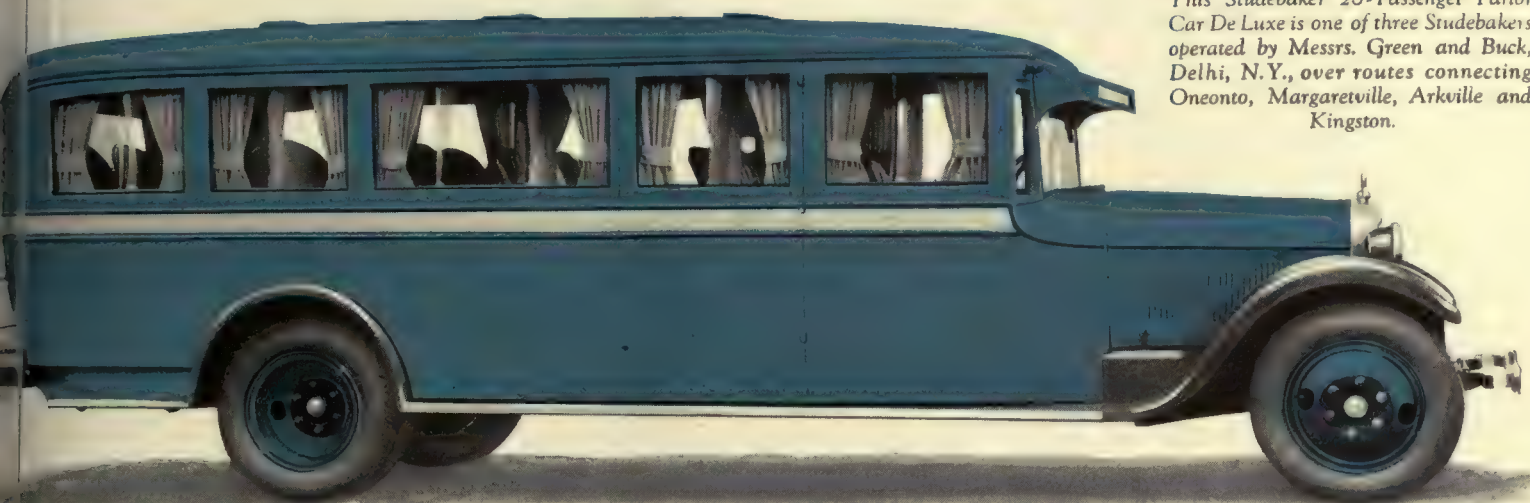
Over this tremendous distance—equal to 4000 times around the earth—Studebaker Busses have encountered every type of road condition—in every state in the Union. And in every case, operating, maintenance and depreciation costs point to the same result: that low-priced, medium-size Studebaker Busses yield more profit per passenger mile.

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STUDEBAKER BUS

Miles of Service



This Studebaker 20-Passenger Parlor Car De Luxe is one of three Studebakers operated by Messrs. Green and Buck, Delhi, N.Y., over routes connecting Oneonta, Margaretville, Arkville and Kingston.

Only the highest-priced busses compare with the Studebaker 20-Passenger Parlor Car De Luxe—yet its price is remarkably low . . . \$6150 *f. o. b. factory*

IN appearance and luxury of riding comfort, this new Parlor Car De Luxe can be compared only with the large parlor car busses selling at from \$10,000 to \$12,000, yet it sells for the remarkably low price, \$6150.

Note the low-hung body with its graceful tapering roof. Length over all, 283 $\frac{3}{4}$ inches. Framework is of selected hardwood. Finish is rich, durable lacquer.

Entrance door (32 inches wide) is on the forward right-hand side. Controlled by hidden mechanism, which is operated by a small hand lever at the left of the driver's seat. Separate door for driver. Emergency door at left rear.

Every interior feature is painstakingly planned to give utmost physical and mental relaxation to passengers. Individual armchairs, upholstered in genuine leather, with cane sides. Liberal leg room (30 inches) and head room (61 inches). Broad center aisle. Accommodation for 20 passengers, including driver.

Luxurious interior

Comfort is enhanced by such details as wide, easily adjustable windows with boquet draperies; mohair head lining and side lining; dome lights; window-post mirrors; an exhaust heating system. Six ventilators are provided—one in the cowl, two over the windshield, and three in the roof—insuring continuous circulation of air without draught. There is a railed-in baggage compartment at the driver's right, and additional accommodation for luggage on the roof.

Complete equipment

Equipment is complete, including stop-signal system; illuminated destination sign box (above windshield); automatic windshield cleaner; rear-view mirror; front and rear bumpers; motometer; extra wheel with tire, tube and carrier, mounted on left front fender; 8-day clock and gasoline gauge, plus the usual instruments, mounted in an oval group under glass; inspection lamp with 10-foot cord. Lights are controlled by a steering-wheel switch.

Due to standardized design and large-scale production, the new Studebaker Parlor Car De Luxe is offered at a remarkably low price. Operators find that its smart appearance and luxurious riding comfort attract continuous patronage, while its very low initial and operating costs insure much higher return upon the operator's investment.

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Prices f. o. b. factory, covering body and chassis, complete. Purchase can be arranged on a liberal Budget Payment Plan—small down payment and balance in convenient monthly installments.

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18-Pass. (including driver) side-entrance Parlor Car.....	\$5300
19-Pass. (including driver) cross-seat Sedan-Type.....	\$5050
20-Pass. (including driver) Parlor-Car De Luxe*	\$6150
21-Pass. Pay-As-You-Enter Street-Car Type*	\$5125

*Includes dual rear wheels.

CHASSIS

Mail the Coupon
for Free Book,
"Profitable Bus Operation"

The Studebaker Corporation of America,
Dept. B. South Bend, Ind.

Send me free "Profitable Bus Operation" without obligation.

Name.....

Address.....

City..... State.....

We have.....busses at present.

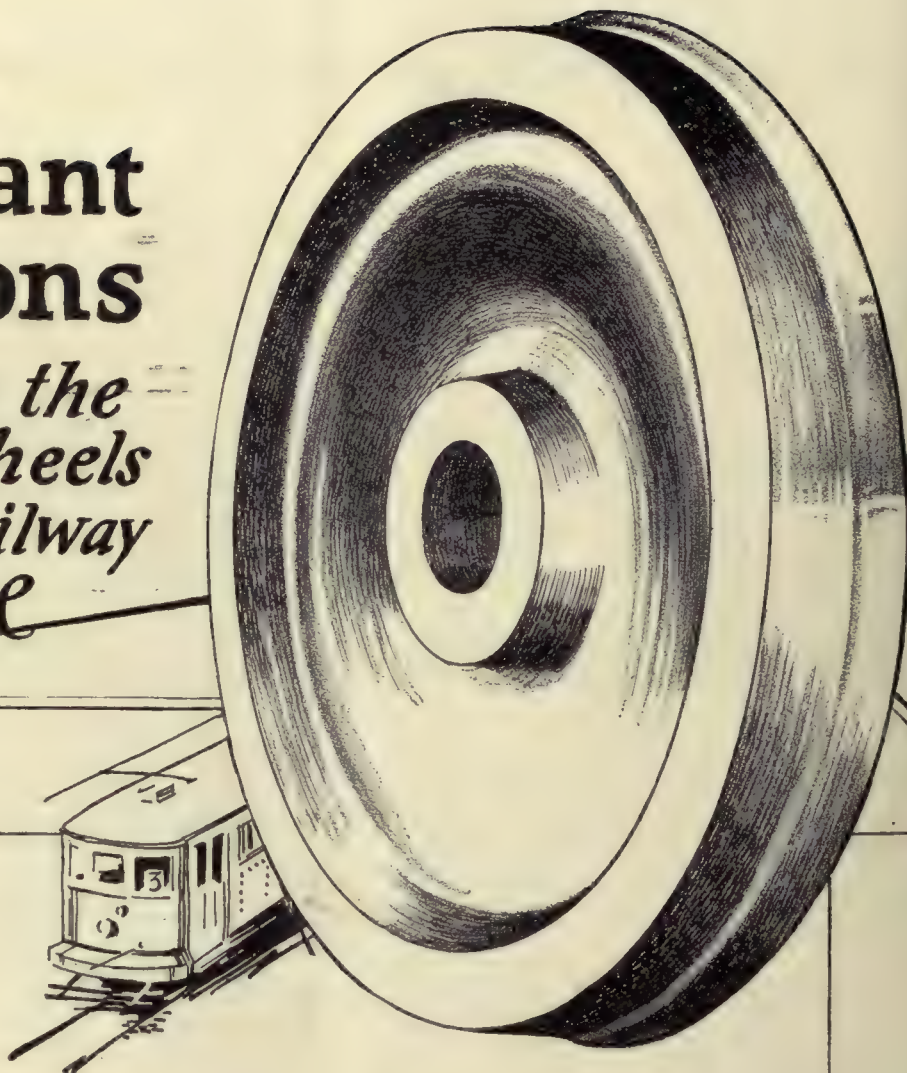
Check below the Studebaker Bus about which you desire information.

Type: Sedan.....Parlor Car.....Street-Car Type.....

Capacity:.....Passengers.

3 Important Questions

*that govern the
value of wheels
in Electric Railway
Service*



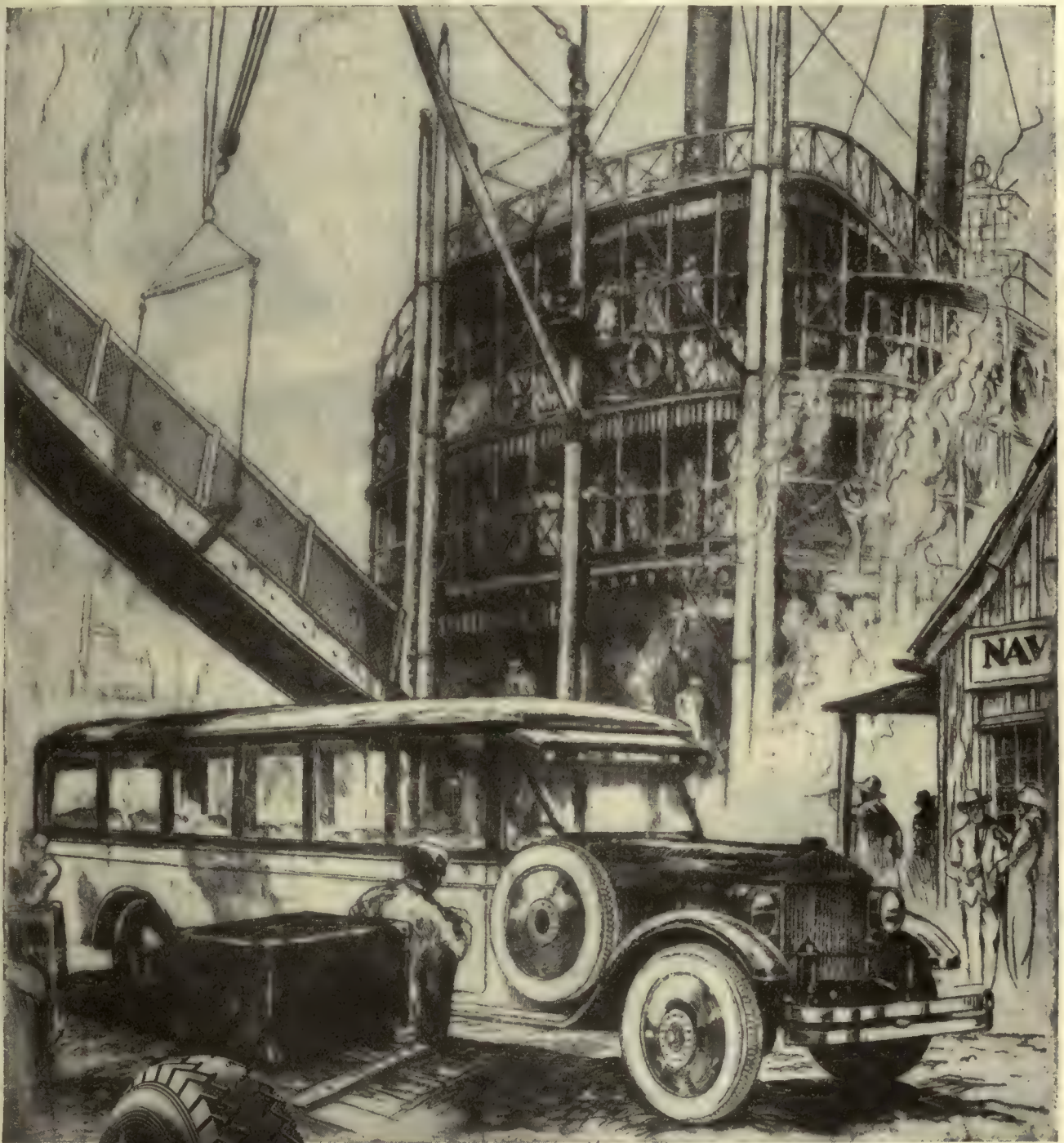
Volumes might be written on the design, construction and other features of wheels, but their true value will always be governed by the manner in which they answer three important questions:

1. Are they *safe*?
2. Are they *dependable*?
3. Are they *economical* in mileage cost?

Gary wheels offer the utmost in *safety* because of their one-piece wrought steel construction; they offer as evidence of their *dependability* the fact that they operate for years without repairs or replacements of any kind . . . and as for *economical mileage cost*, they refer you to the proper department of any of the many railroads that have kept records concerning them. Our wheel specialists are at your command.

Illinois Steel Company

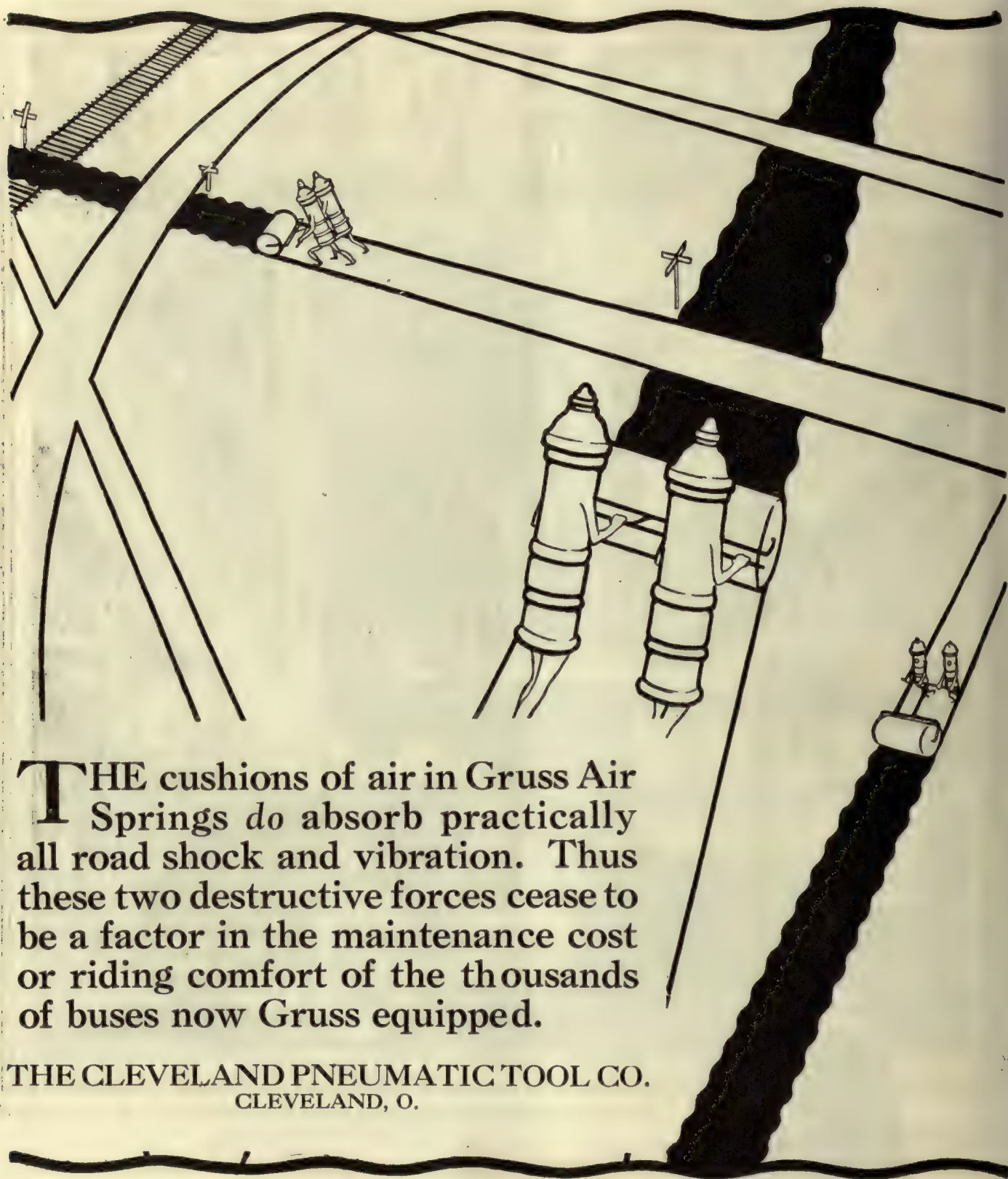
General Offices, 208 South LaSalle St.
Chicago, Illinois



Etching made for the Kelly-Springfield Tire Company, by O. Kuhler, Pittsburgh

THE motor coach as the tremendous factor it now is in passenger transportation was made possible by the development of pneumatic tires sturdy enough to stand up under the terrific strains involved. In the development of such tires Kelly-Springfield engineers have played an important part. The Kelly Heavy-Duty Cord tire represents the latest step forward in dependability and economy, a fact recognized by the constantly increasing number of motor coach operators who are adopting it as exclusive equipment.

KELLY-SPRINGFIELD TIRES



THE cushions of air in Gruss Air Springs *do* absorb practically all road shock and vibration. Thus these two destructive forces cease to be a factor in the maintenance cost or riding comfort of the thousands of buses now Gruss equipped.

THE CLEVELAND PNEUMATIC TOOL CO.
CLEVELAND, O.

GRUSS AIR SPRINGS

*for Trucks, Buses
Passenger Cars ~*



"Canned Experience"

Make use of the other man's experience

That old saying

about experience being the best teacher is absolutely sound in one sense. But most of us recite it without thinking that experience may be of various sorts—the experience of other men as well as our own. "Canned experience," if you please, ready for use. Just open and serve yourself! Why not take advantage of the experience of other men as far as we can and save not only years of time but many expensive lessons?

Do you know how much of the world's best research in the electric railway field is contained in

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Home Address
City
Position
Name of Company

EL 7-24-26

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Mr. *Wm. A. Painter* Title *Chief Engineer*
 Subscriber to *Am. Mechanical* Company *Self*
 City *Detroit*

Reads advertising section

1. No ☐ Check here
 2. Occasionally ☐
 3. Regularly, as source of information on developments and improvements ☒

Suggestions to improve advertising section (new equipment that should be advertised, kind of information desired in advertising, etc.)
Has been a subscriber for over 35 years has clipping and the index x

Report of Recent Purchases (Equipment, Materials or Supplies)
 Initiated by advertising appearing in *Electrical World*

Name of Purchaser *[Redacted]* Paper *Time*
 Address *[Redacted]* Representative reporting *J. A.*
 Date *[Redacted]*

Product	Manufacturer's Name	Quantity
<i>✓</i>	<i>Switchboards</i>	<i>Allen</i>
<i>✓</i>	<i>Generators</i>	<i>Halmer</i>
<i>14</i>	<i>Motors</i>	<i>Westinghouse</i>

(OVER)



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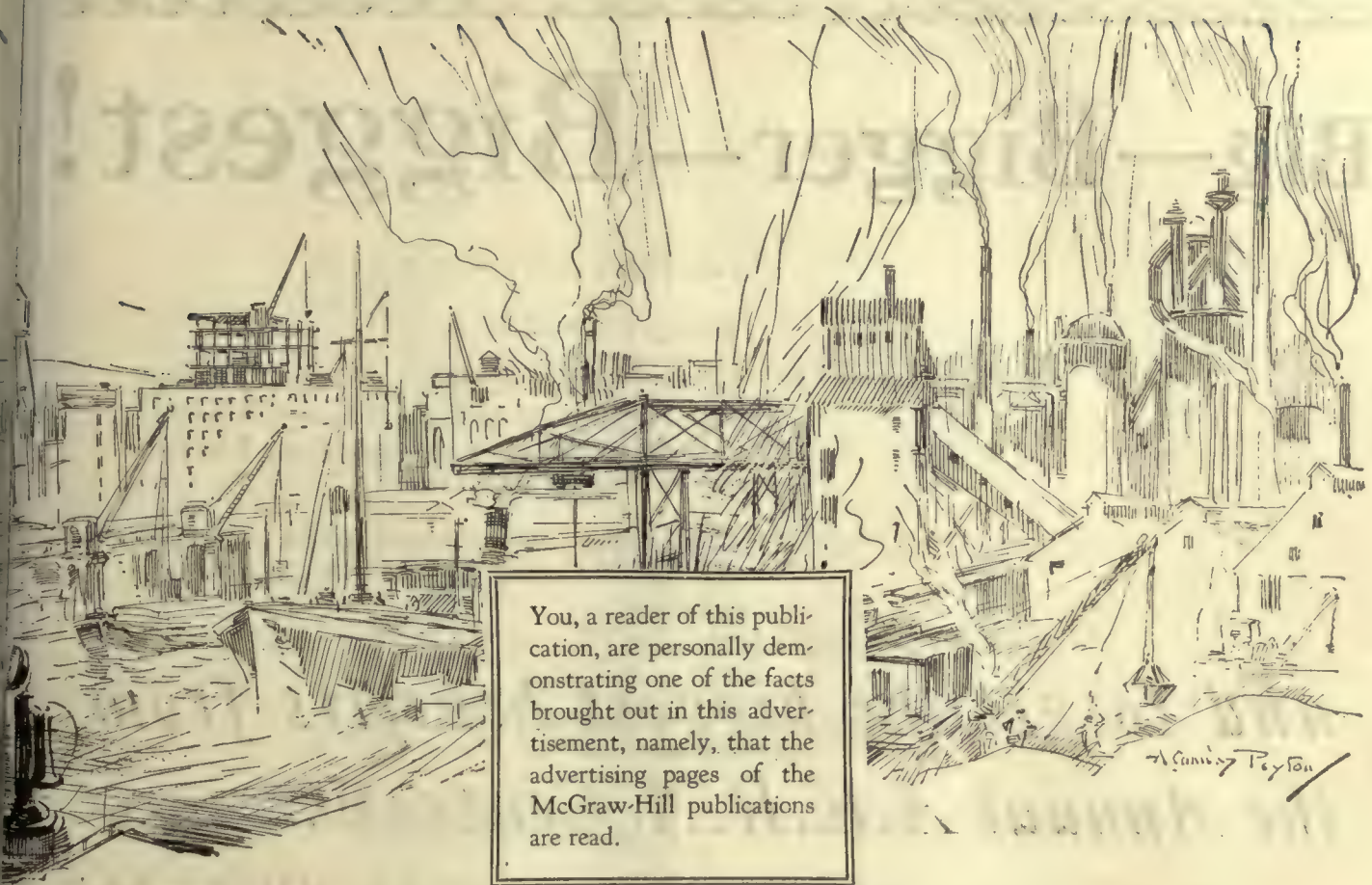
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ANALYSIS OF METALLIC AND NON-METALLIC
MINING, QUARRYING AND CEMENT INDUSTRIES

Big—Bigger—Biggest!

Last year's convention was *big*!

This year's will be *bigger*!

In fact actual Exhibitors' space reservations already made indicate that it will be the *biggest* Convention of the American Electric Railway Association.

It all means more interest, more optimism—and *more buying* by the electric railway companies.

and to get the biggest benefits from the Annual A.E.R.A. Convention—use

ELECTRIC RAILWAY JOURNAL'S Complete Convention Service

New attractions for the reader—and new opportunities for the advertiser. A service which will afford the only effective and permanent meeting place for buyer and seller. It will enable you to put *your* message before the entire railway field, the stay-at-homes as well as the Delegates, before, during and after the Convention. This *is* complete service.

Advertising rates on request.

Annual Convention Number dated September 25

A complete volume on the theme of "Modern Cars Pay," written by recognized authorities. The big opportunity to ally your products with the thinking of the industry in the biggest single sales factor in the electric railway industry.

Three Daily Convention Issues dated October 5, 6, 7

The only way to reach every delegate at the Convention. Distributed on three mornings at the breakfast table and at the pier.

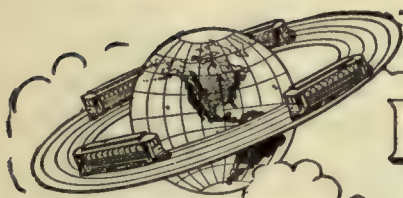
Annual Convention Report Number dated October 9

The first and only complete report of papers, proceedings and discussion—mailed 24 hours after the close of the convention.

Electric Railway Journal, 10 Ave. at 36th St., New York City

Member A.B.C., A.B.P., A.E.R.A.

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

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1926

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CORRECT IT
USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

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PANTASOTE

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Seat and Curtain Materials
There is no substitute for Pantasote

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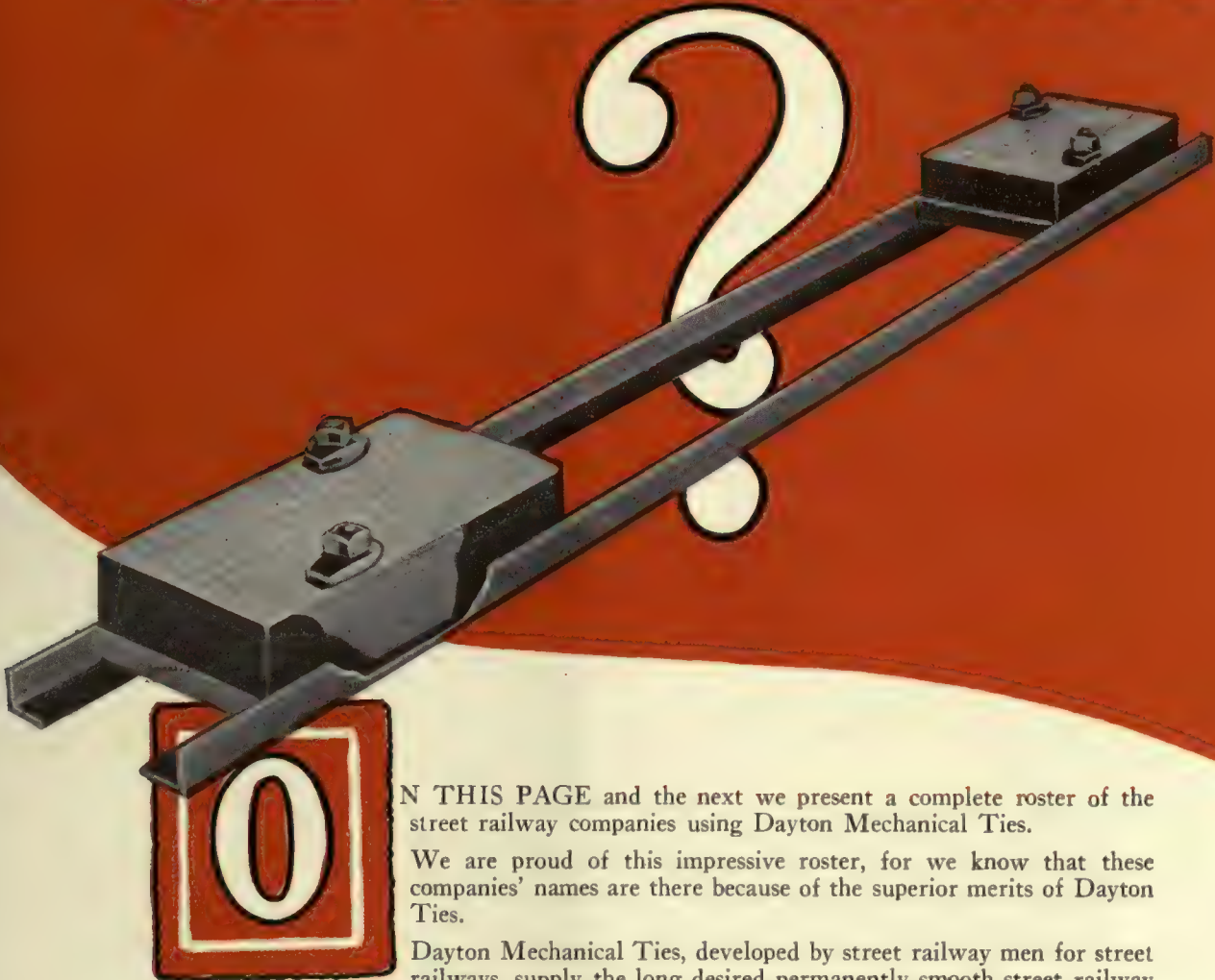
Roofing—Headlining—Wainscoting
The only homogeneous panel board

standard
for electric railway cars
and motor buses

The PANTASOTE COMPANY Inc.
 At 46th, 250 Park Avenue Street
NEW YORK



Is Your Company On This Roster



ON THIS PAGE and the next we present a complete roster of the street railway companies using Dayton Mechanical Ties.

We are proud of this impressive roster, for we know that these companies' names are there because of the superior merits of Dayton Ties.

Dayton Mechanical Ties, developed by street railway men for street railways, supply the long desired permanently smooth street railway track. They cut rolling stock repairs in half, practically extinguish track maintenance, reduce noise, and add to passenger comfort. They are cheaper in first cost than wood ties, cheaper to lay, and far more lasting.

So, if your company name is not on this roster, we feel sure you will at least want to make a thorough investigation of Dayton Mechanical Ties. May we send you complete data? A note will bring it.

Complete Roster of Users of Dayton Mechanical Ties

Dubuque, Iowa.
People's Ry. Co.,
Dayton, Ohio.
Texas Electric Co.,
Waco, Texas.
Toledo Ry. & Lt. Co.,
Toledo, Ohio.
City Ry. Co.,
Dayton, Ohio.
D. S. & X. S. Ry. Co.,
Dayton, Ohio.
No. Branch Tr. Co.,
Bloomsburg, Pa.
Harrisburg, Pa.

Vincennes Tr. Co.,
Vincennes, Ind.
No. Ohio Tr. & Lt. Co.,
Akron, Ohio.
Boston Elevated,
Boston, Mass.
Pittsburgh Rys. Co.,
Pittsburgh, Pa.
Dayton & Troy Elec.,
Piqua, Ohio.
Ohio Valley Elec. Ry.,
Huntington, W. Va.
J. G. White Eng. Corp.,
Manila, P. I.

Cincl. & Dayton Tr. Co.,
Hamilton, Ohio.
Poughkeepsie & W. F.
West Penn. Lt. & Pwr.
Stark Elec. Ry.,
Alliance, Ohio.
Illinois Pwr. & Lt.,
Peoria, Ill.
Bloomington, Ill.
Champaign, Ill.
Danville, Ill.
Galesburg, Ill.
T. H. I. & E.,
Terre Haute, Ind.

Union Trac. Co.,
Muncie, Ind.
Newport N. & H. Ry. G. El.
Hampton, Va.
E. Wisconsin Elec.,
Sheboygan, Wis.
Milwaukee El. Ry. & Lt.,
Milwaukee, Wis.
Louisville Ry. Co.,
Louisville, Ky.
Youngstown Muncie.,
Youngstown, Ohio.
So. Canada Power Co.,
Sherbrook, Que.

Rhode Island Co.
Gary St. Ry.,
Gary, Ind.
Union Trac. Co. of Ind.,
Muncie, Ind.
St. Jos. Ry. Lt. Ht. & Pwr.
Lehigh Valley Trac. Co.
Schuylkill Ry. Co.,
Girardsville, Pa.
D. C. & P., Dayton, Ohio.
Beloit Trac. Co.,
Wisconsin.
Homestead & Mifflin Ry.,
Homestead, Pa.

Continued on next page

The Dayton Mechanical Tie Co.

DAYTON, OHIO

Roster of Dayton Tie Users

(continued)



Peoria, Ill.



Terre Haute, Ind.



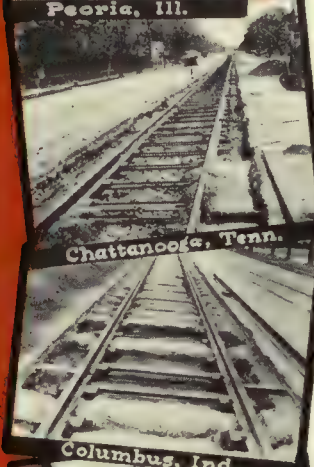
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Pottsville, Pa.



Ashtabula, Ohio



Chattanooga, Tenn.



Columbus, Ind.



Alliance, Ohio



Dayton, Ohio



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Waco, Texas



Belmont, Ohio



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Kansas City, Mo.



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Rockford, Ill.
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Benton Harbor & St. Joe,
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Utah Lt. & Trac. Co.,
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The Dayton Mechanical Tie Co.

DAYTON, OHIO.

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Manufacturers of Steel Structures of all classes
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Coal Hauling
Concrete Materials
Waste Handling
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Use These Labor Savers

Differential Crane Car
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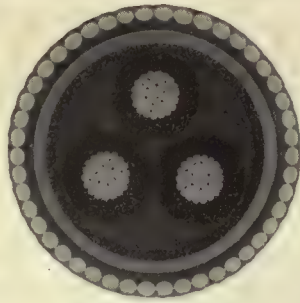
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United States Steel Products Company, New York, N. Y.



STANDARD Wires and Cables

include a complete line of products for aerial, underground and submarine service. They can be supplied bare or insulated and of copper, brass, bronze or copper clad steel.

The conductors are rolled drawn and insulated in our own mills and are under our careful supervision and inspection from wire-bar to finished product.

The STANDARD guarantee consists of over 44 years of specialized experience in the manufacture and installation of electric wires and cables. This experience is at your service.

Standard Underground Cable Co.

BOSTON PHILADELPHIA PITTSBURGH CHICAGO DETROIT
NEW YORK WASHINGTON ST. LOUIS SAN FRANCISCO
FOR CANADA: STANDARD UNDERGROUND CABLE CO.
OF CANADA, LIMITED, HAMILTON, ONT.

"The Standard for Rubber Insulation"

INSULATED WIRES and CABLES

"Okonite," "Manson," and Dundee "A" "B" Tapes

Send for Handbook

The Okonite Company

The Okonite-Callender Cable Company, Inc.

Factories, PASSAIC, N. J.

PATERSON, N. J.

Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
Birmingham San Francisco Los Angeles Seattle

Pettingell-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

Gen. Rep.: Engineering Materials Limited, Montreal.

Cuban Rep.: Victor G. Mendoza Co., Havana.



ELRECO TUBULAR POLES



THE "WIRE LOCK"

THE CHAMFERED JOINT

COMBINE

Lowest Cost

Least Maintenance

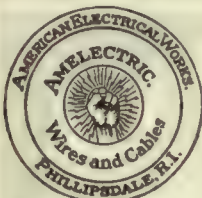
Lightest Weight

Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street



Reg. U. S. Pat. Office

Incandescent Lamp Cord

AMELECTRIC PRODUCTS

BARE COPPER WIRE AND CABLE

TROLLEY WIRE

**WEATHERPROOF WIRE
AND CABLE**

**PAPER INSULATED
UNDERGROUND CABLE**

MAGNET WIRE

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 20-32 West Randolph Street;
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

THE WORLD'S STANDARD

"IRVINGTON"

Black and Yellow
Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

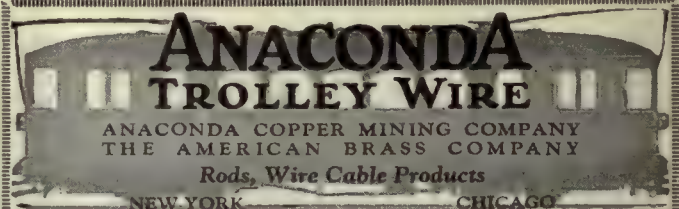
Irvington Varnish & Insulator Co.
Irvington, N. J.

Sales Representatives in the Principal Cities

*There is a
Peirce Specialty for
every Distribution
requirement*



Hubbard and COMPANY
PITTSBURGH OAKLAND, CAL. CHICAGO



Rods, Wire Cable Products

NEW YORK

CHICAGO

**NACHOD & UNITED STATES
SIGNAL CO., INC.**

LOUISVILLE, KY.

BLOCK SIGNALS

FOR
**ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS**



SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches.....\$4.50 an inch
4 to 7 inches.....4.30 an inch
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Rates for larger spaces, or yearly rates, on request.
An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

E R J

POSITIONS WANTED

SCHEDULE maker with six years' experience in both street railway and motor coach schedules, would like position in this line of work. References furnished as to ability. PW-918, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

SUPERINTENDENT—Now employed but looking for better opportunities, desires change, experienced in high-speed interurban, city and bus operation. Can handle men and produce results, recognized as a careful, progressive and competent official; references from present and past employers. PW-919, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT with twenty years' experience in operation and maintenance of railway rolling stock and track; an outstanding success as a railway operator and as operator of co-ordinated railway and bus services desires for personal reason to make change. Fully capable of taking complete charge as manager or superintendent. PW-917, Electric Railway Journal, 7 South Dearborn St., Chicago, Ill.

TO HELP YOU

LOCATE COMPETENT MEN

"Searchlight" Advertising

G-3

OFFICIAL PROPOSALS

Bids: Aug. 27.

Steel Passenger Cars and Car Trucks

BROAD STREET SUBWAY
Contract No. 135

Philadelphia, Pa.
DEPARTMENT OF CITY TRANSIT,
CITY OF PHILADELPHIA, 11th Floor,
1211 Chestnut Street, Philadelphia, July 17, 1926.

Sealed proposals, addressed to the undersigned at the office above mentioned, will be received until 11 o'clock a.m. (Eastern Standard Time), on Friday August 27, 1926, and publicly opened immediately thereafter, for constructing and delivering to the City 150 Steel Passenger Cars and 10 extra car trucks.

Plans and specifications may be seen at the office of the Department, on the twelfth floor, 1211 Chestnut Street, and copies of same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of fifty (50) dollars will be required for the plans and specifications. This deposit will be refunded upon return of the plans and specifications in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accompanied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia to the amount of five (5) per centum of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

H. E. EHLERS, Director.

FOR SALE

Machine Wheel Lathe

No. 13535. Maximum swing of this machine 49-in., maximum length of axle 9-ft., made by the Niles-Bement-Pond Co., Niles Tool Works, Canton, Ohio.

C. W. LEPPER

General Purchasing Agent
435 Sixth Ave., Pittsburgh, Pa.
Attention Mr. Josiah Poole

FOR SALE

14 BIRNEY SAFETY CARS

Brill Built

West. 508 or G.E. 264 Motors
Cars Complete—Low Price—Fine Condition
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

TO HELP YOU

LOCATE SELLING OPPORTUNITIES

"Searchlight" Advertising

G-6

ELECTRIC RAILWAY EQUIPMENT!

Car Hoist

1—Universal. Columbia Mch. Co. make. Motor and control equipment included

Birney Cars

4—32 seating capacity Westinghouse 508A motors. Fully equipped. Splendid condition.

Tower Truck

1—2½-3 ton White. Three section. Fully equipped. New 1923.

Concrete Mixer

1—Jaeger Portable Concrete Mixer. ½-yd. capacity

Welding Machine

1—Railway Welding and Bonding Co. New 1923. Fully equipped.

Sweeper

1—Double truck Snow Sweeper. Fully equipped

Southern Cars

6—Double truck. 42 passenger. One man operation.

Track Grinder

1—Atlas Rail Grinder new 1923. Excellent condition

Railway Motors

25—Westinghouse 307's
G.E. 80's.

Track Drill

When operations of the
New York & Long
Island Traction Co.

ceased,—all equipment was purchased by us for resale. This unusual opportunity was then created for railway companies to secure at unbelievable savings the little-used equipment shown here.

All is in excellent condition—and the low prices will surprise you. Write for complete information and prices on what you can use.

H. E. Salzberg Co.,
Inc.

50 Church St., New York City

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Air Springs
Cleveland Pneumatic Tool Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch
Stands
Ramapo Ajax Corp.

Automatic Safety Switch
Stands
Ramapo Ajax Corp.

Axles
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Illinois Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Front
Shuler Axle Co.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.
Ludlum Steel Co.

Babbitt Metal
Johnson & Co., J. R.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Barges, Steel
American Bridge Co.

Batteries, Dry
Nichols Lantern Co.

Bearings and Bearing Metals
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller
Hid.
Stueki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Cummings Car & Coach Co.

Body Material, Haskellite and Plymet
Haskellite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoe & Foundry Co.
Brill Co., The J. G.

Brakes, Brake Systems and Brake Parts
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Westinghouse E. & M. Co.

Buildings, Steel
American Bridge Co.

Bulkheads
Haskellite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Bus Seats
Hale-Kilburn Co.
Karpen Bros., S.

Buses, Motor
Brill Co., The J. G.
Cummings Car & Coach Co.
International Motor Co.
Mack Trucks, Inc.
Studebaker Corp. of Amer.
Yellow Truck & Coach Co.

Bushings, Case Hardened and Manganese
Brill Co., The J. G.

Cables, (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.

Cars, Gas, Rail
Brill Co., The J. G.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Gray Iron and Steel
American Brake Shoe & Foundry Co.
American Bridge Co.
American Steel Foundries
Wm. Wharton, Jr. & Co.

Castings, Malleable and Brass
American Brake Shoe & Foundry Co.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskellite Mfg. Corp.
Pantacote Co., Inc.

Ceilings, Plywood, Panels
Haskellite Mfg. Corp.

Change Carriers
Cleveland Fare Box Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

Coil Banding and Winding Machines
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condenser Papers
Irvington Varnish & Ins. Co.

Conduits, Underground
Standard Underground Cable Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.

Conveying & Hoisting Machinery
American Bridge Co.

Copper Wire
American Brass Co.
Amer. Steel & Wire Co.
Anaconda Copper Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
Amer. Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebbing's Sons Co., John A.

Cord Connectors and Cords
Samson Cordage Works

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes, Hoists & Lifts
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantacote Co., Inc.

Dealer's Machinery & Second Hand Equipment
Elec. Equipment Co.
Lepper, C. W.
Salzberg Co., Inc., H. E.

Dealer Second Hand Rails
Electric Equipment Co.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish-Serv. P. Edward

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heating Co.
Nat'l Pneumatic Co., Inc.

Doors & Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale-Kilburn Co.
Morton Mfg. Co.

Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.

Drills, Track
Amer. Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Ears
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Trackwork Co.

Electric Transmission Towers
American Bridge Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.
John A. Roebbing's Sons Co.

Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.

Engineers, Consulting, Contracting and Operating
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layne Corp.
Bylesby & Co., H. M.
Day & Zimmermann, Inc.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLuw
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.

Exterior Side Panels
Haskellite Mfg. Corp.

Fare Boxes
Cleveland Fare Box Co.
Nat'l Ry. Appliance Co.
Percy Mfg. Co.

Fare Registers
Electric Service Supplies Co.

Fences, Woven Wire and Fence Posts
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

Flangeway Guards, Steel
W. S. Godwin Co., Inc.

Flaximum Insulators
National Railway Appliance Co.

Floodlights
Electric Service Supplies Co.

Floor, Sub
Haskellite Mfg. Corp.

Floors
Haskellite Mfg. Corp.

Forgings
Brill Co., The J. G.
Carnegie Steel Co.

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Furnaces, Electric, Steel
Melting
American Bridge Co.

Funnell Castings
Wm. Wharton, Jr. & Co.

Fuses and Fuse Boxes
Consolidated Car Heating Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.
Westinghouse E. & M. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.

Gauges, Oil and Water
Ohio Brass Co.

Gear Blanks
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.

Gear Cases
Chillingworth Mfg. Co.
Electric Service Supplies Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bethlehem Steel Co.
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.

Generating Sets, Gas-Electric
General Electric Co.

Generators
General Electric Co.
Westinghouse E. & M. Co.

Glider Rails
Bethlehem Steel Co.
Lorain Steel Co.

Gongs (See Bells and Gongs)

Greases (See Lubricants)

Grinders & Grinding Supplies
Metal & Thermit Corp.
Railway Trackwork Co.

Grinders, Portable
Railway Trackwork Co.

Grinders, Portable Electric
Railway Trackwork Co.

Grinding Bricks and Wheels
Railway Trackwork Co.

Guard Rail Clamps
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Harps, Trolley
Elec. Service Supplies Co.
Nuttall Co., R. D.
Star Brass Works

Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Headlining
Haskellite Mfg. Corp.
Pantacote Co., Inc.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Traction Brake Co.

Instruments Measuring, Testing and Recording
Amer. Steel & Wire Co.
General Electric Co.
Westinghouse E. & M. Co.

(Continued on page 46)

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building



WORKS
Bayonne, N. J.
Barberton, Ohio

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguilar 104
SAN JUAN, Porto Rico, Royal Bank Building

Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago
New York

Boston
Cleveland

Pittsburgh
Denver

San Francisco

U. S. Steel Products Co.
Los Angeles

Portland

Seattle

B. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions	Ft. Pitt Spring & Mfg. Co., Springs
Anglo-American Varnish Co., Varnishes, Enamels, etc.	Flaxlinum Insulation
National Hand Holds	Anderson Slack Adjusters
Genesco Paint Oils	Economy Electric Devices Co., Power Saving and Inspection Meters
Dunham Hopper Door Device	Yellow Coach Mfg. Company— Single and Double-deck Buses
Garland Ventilators	
Walter Tractor Snow Plows	
Feasible Drop Brake Staffs	

Instantaneous Registration by the Passenger

ROOKE of fare collection— SYSTEM

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register portable or stationary, at option. Handles nickels, dimes, quarters, or metal tickets, in any combination, FLEXIBILITY with CERTAINTY.



Roke Automatic Register Company Providence, R. I.



Type R-11
Double Register

International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

The International Register Co.

15 South Throop Street, Chicago, Illinois



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.

Cleveland, Ohio

Chicago Representatives: Jameson-Ross Company,
Straus Bldg.

- Insulating Cloth, Paper and Tape**
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite-Callender Cable Co.
Standard Underground Cable Co.
United States Rubber Co.
Westinghouse E. & M. Co.
- Insulating, Silk**
Irvington Varnish & Ins. Co.
- Insulating Varnishes**
Irvington Varnish and Insulator Co.
- Insulation (See also Paints)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.
- Insulation Slits**
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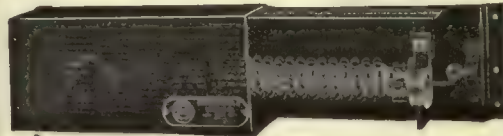


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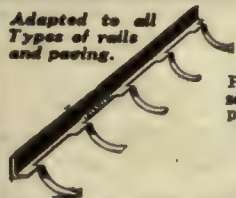
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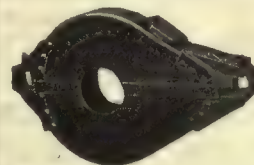
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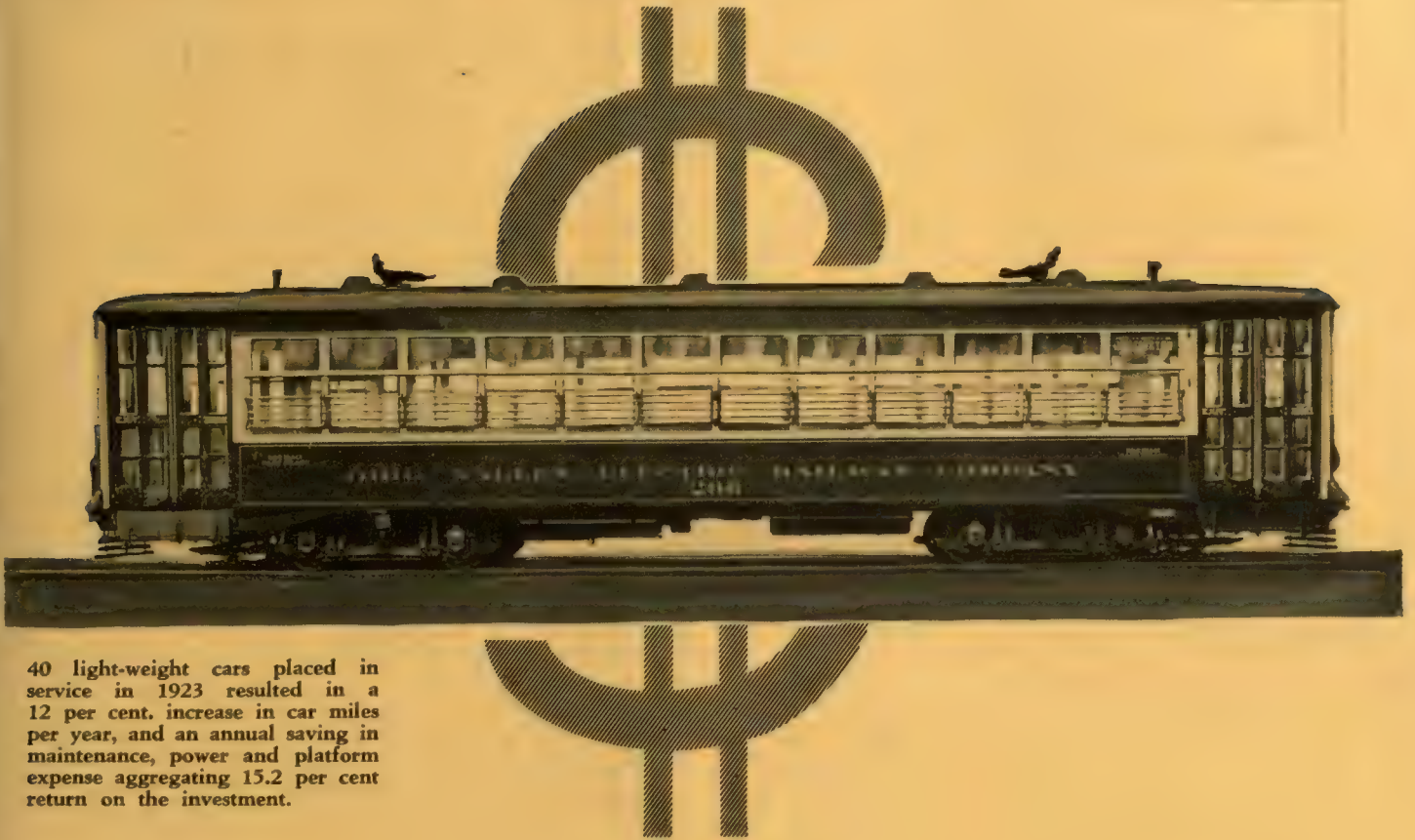
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No. 5

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"Neither Snow nor Rain nor Heat nor Night Interferes with Their Appointed Task"

A PROMINENT business firm in New York recently announced that its office would be closed during the last two weeks in August to allow everyone connected with the organization to take a vacation. In many other lines of work, there is a considerable cessation of work during the heated season.

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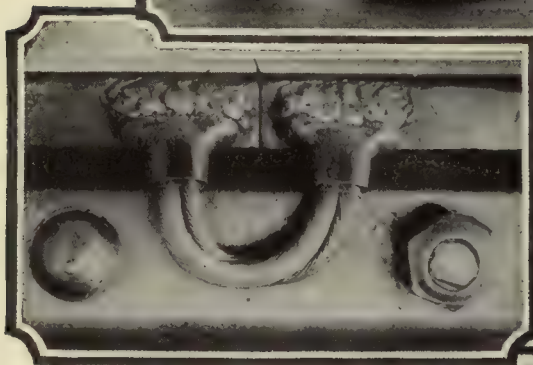
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A Complete Service

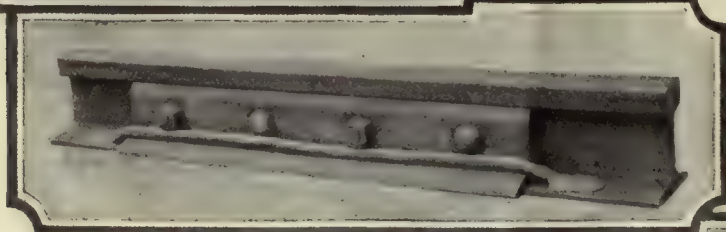
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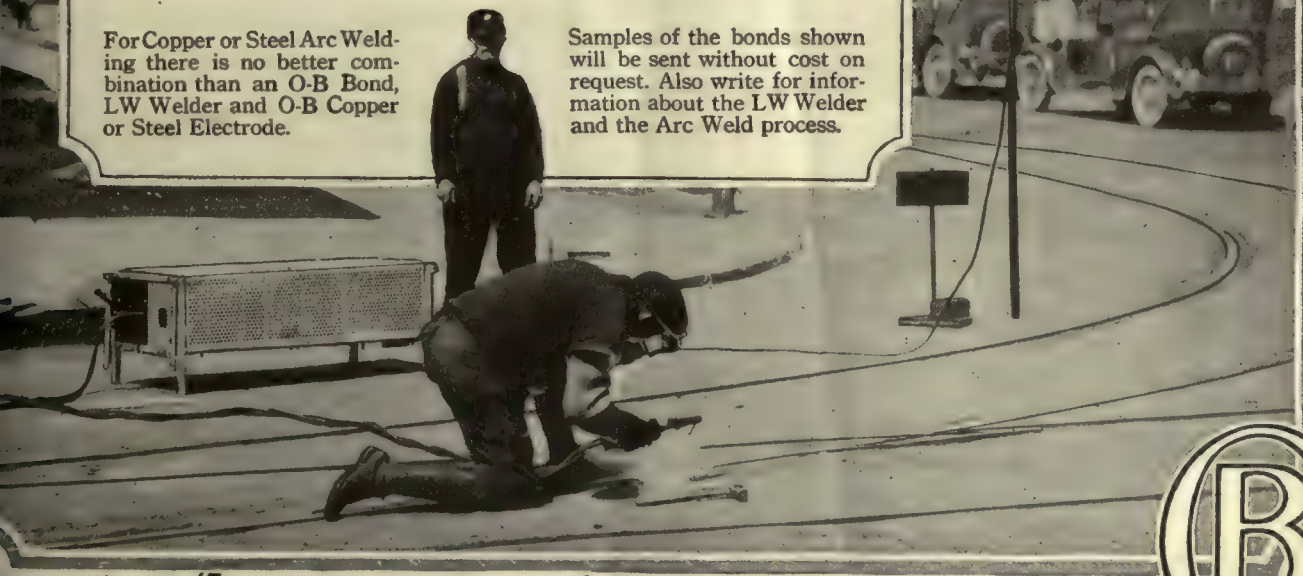
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In March, this paper editorially said:

“Noise Elimination Is an Asset in Public Relations. Noise is generally the earmark of wasted energy. It is more. It is wasted public relations. No amount of advertising or publicity can counteract the rattle of a car in bad order on a stretch of poor track.

A noted operator of public utilities once wisely said that the physical property of a railway was too much in evidence. A passenger comes in daily contact with two or more employees, pays out money several times a day, rides in several of the cars, and sees all of the others pass him on the line. He sees and is otherwise aware of the track, and possibly sees the car shop and a good part of the power distribution system along the route of his trip. * * *

With no immediate likelihood of being able to submerge the equipment and personnel so that they are out of sight and hearing, the next best thing that can be accomplished by railway operators is to make the equipment more pleasing to eyes and ears. So no effort should be spared to reduce the unpleasant noise of operation.

Much has been accomplished along these lines, but much more remains to be done. The automobile is a bogey to shoot at. Perhaps it can be bettered. Nothing is impossible with the combination of right thinking and a desire to win.”

Many right thinking railway men with the desire to win are using the noise eliminators shown on this page.

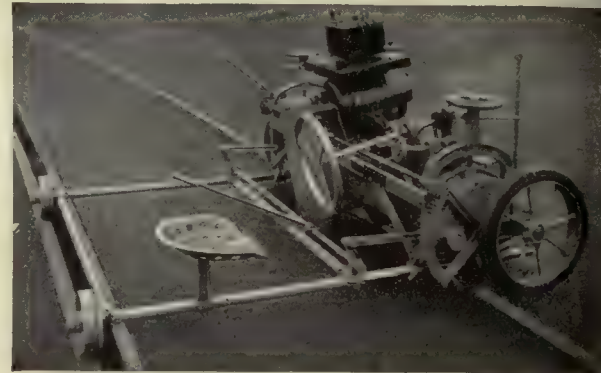
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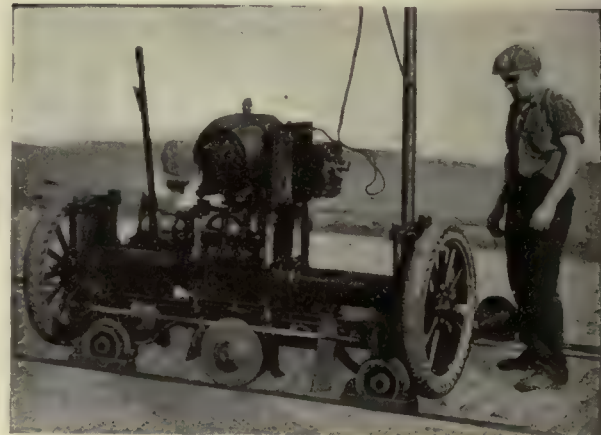
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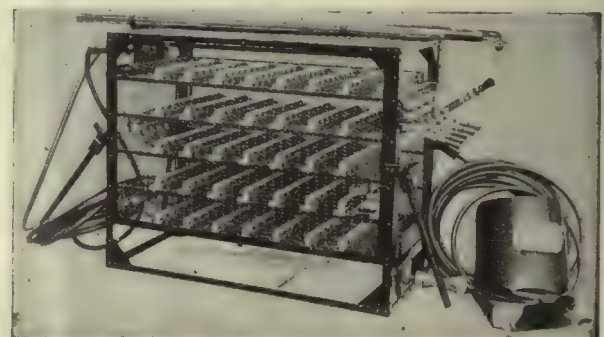
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SAVING THE RAIL SAVES THE RAILWAY

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Publicity
Illumination
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TO PROVIDE proper illumination is to both please and attract passengers—especially those daily riders who want to read while traveling to and from work.

The bright, well diffused light provided by Safety Car Lighting Fixtures fully meets just such requirements for railway cars and the Keystone-Ivanhoe Fixtures for Buses.

Full information gladly sent on request.

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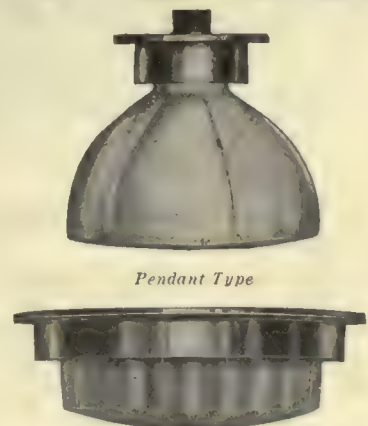
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Renewable Track . . . Permanent Foundation

Reg. U. S.

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MACK buses embody in their construction a number of features which are not found in any other. These features have been developed during twenty-six years of specializing in motor buses and trucks. They are based upon longer experience than that of any other American manufacturer. Each has a practical reason for being and has been proved out in the service of many thousands of users. All of these features are original with the Mack. Many are patented. (Page numbers refer to catalog.)

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CRANKSHAFT—3-inch diameter, case-hardened and counterbalanced. (See page 15.)

CYLINDERS—Heat-treated, roller burnished and lapped. (See page 14.)

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ENGINE SUSPENSION—3-point suspension by steel beams. Rear main bearing through-bolted to rear support beam. (See page 13.)

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WATER PUMP—Balanced type, bronze rotor. Stainless steel shaft. Single packing, greaseless. (See page 17.)

CRANKCASE—Heat-treated aluminum. Quick-removable inspection ports, unobstructed. (See page 16.)

INTAKE MANIFOLD—Compensating exhaust-heated vaporizer delivers dry gas to cylinders. (See page 16.)

WATER DISTRIBUTION—Water manifold cast integral with cylinder block, delivering cool water direct to exhaust valve jackets. (See page 17.)

LUBRICATION—Water-cooled oil reservoir, cast on front cylinder block. Oil double-strained and fed through cast-in leads. (See page 18.)

RADIATOR—Shock-Insulated support. Hand-operated shutters. (See page 17.)

IN THE CHASSIS

SUSPENSION—Mack rubber Shock Insulators, eliminating spring shackles and increasing ease of riding and length of chassis life. (See page 26.)

DRIVE—Dual Reduction Drive, with ground gears. (See pages 20 and 21.)

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TRANSMISSION—Interrupted splines on sliding gear shaft. (See page 20.) Gears ground on true generating principle. (See page 20.) Positive oil circulation. (See page 20.)

DRIVESHAFT BRAKE—Independently mounted between two bearings, two frame cross-members and two universals. (See page 26.)

CLUTCH—Rounded teeth on clutch drum to eliminate sticking of disks. (See page 19.)

CONTROL—Triggerless reverse latch on gear-shift lever. (See page 20.)

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 29-Passenger Gas-Electric

Pat. Off.

Only Quality determines Performance

In the bus industry where quality determines performance, and performance in turn determines future sales, the manufacturer cannot hope to become a factor in the field through the medium of mere high-sounding promises.

Due to its greater speed over the uneven surfaces of highways, a bus is actually subjected to more severe wracking strains than other transportation vehicles traveling the same roads. For this reason, each of its component parts, if it is to have a profitable life over a period of years, must not only have unusual safety factors built into them, but the material and workmanship must be of the highest grade obtainable regardless of cost. There is no profit in a one year vehicle of any kind.

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THE largest unit yet constructed for the generation of electric power was recently ordered for the Hell Gate Station of the United Electric Light & Power Company. This turbo-generator will be built by the American Brown Boveri Electric Corporation at its main plant in Camden, New Jersey.

The size and character of this unit presents for the consideration of American Utilities engineers an entirely new ratio between equipment costs and land and building costs, in the Kw. price of generating stations.

The United Electric Light & Power Company has always been recognized to be among the most progressive of America's electrical companies. Its management has faced and met electrical problems created through the growth of New York City, by the use of engineering talent of resource and vision.

AMERICAN

announces —

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Electrical and Mechanical Characteristics

Power output — 251,000 hp. at unity power factor,
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power factor.

Direct-connected excitors.

Compound unit — reaction type throughout.

Throttle pressure — 265 lb. per sq. inch.

Superheat — 200 deg. (present conditions at Hell
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Maximum steam temperature — 750 deg. F.

Single-flow, high-pressure element operates at
1,800 r.p.m.

Double-flow, low-pressure element, operates at
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Total weight — 2,810,000 lb.

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The Selector Valve permits independent control of entrance and exit doors

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It is a Safety Car
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Operating safety is increased and operating expense is decreased when operating responsibility is centralized in one man whose duties are safeguarded and simplified by complete protective and labor-saving devices which interlock car control, door opening, and brake manipulation.

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The Tampa Electric Company has recently put into service seven modern light weight cars, which are equipped with Westinghouse Variable Load Brakes.

Here is still another traction property which is to realize the marked advantages of this most modern form of brake equipment for modern surface cars.

Westinghouse Variable Load Brakes provide for the same effectiveness of retardation throughout the entire range of car loading, thus assuring uniformly short stops which are reflected in greater safety and increased schedule speeds.

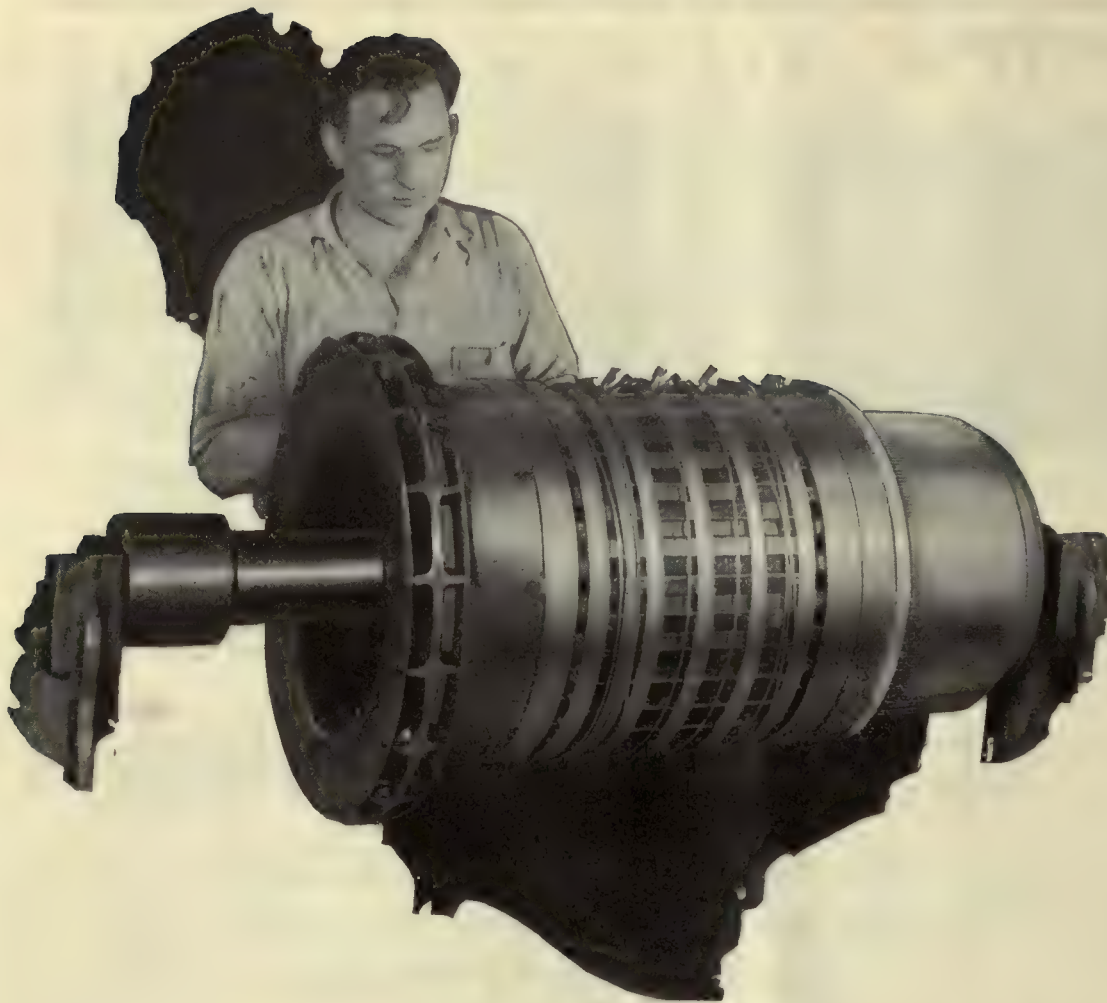


Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office—*Ask for Descriptive Catalogue T-2045.*

WESTINGHOUSE TRACTION BRAKE CO.

General Office and Works: WILMERDING, PA.

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Keep out "weak links"

Motor parts uniformly good are just as important in a motor that is being overhauled, as in a motor that is being built. The coils must be properly designed for the work; the insulation must be ample, of high quality and correctly fitted; all other parts and materials must be produced with full knowledge of their relationships to one another and to the whole motor assembly.

Insist on having General Electric parts, which necessarily meet these specifications. This Company's possession of complete data as to all the G-E Motors you have in operation, puts it in the position to furnish renewal parts of original-equipment quality—the only safe standard.



Every year more electric railway operators are learning by experience the economic advantages of keeping their G-E Car Equipment G-E throughout.



For
Original Equipment Quality

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, July 31, 1926

Number 5

Experience Proves Soundness of No-Parking Theory

THEORETICAL arguments showing how transportation conditions could be improved in congested streets by the restriction of automobile parking usually have fallen on deaf ears. Lately, however, the soundness of this theory has been proved beyond dispute in two widely separated cities. In Chicago the huge crowds attending the Eucharistic Congress were successfully handled by the existing local transportation agencies because parking had been completely eliminated in the congested districts. More recently, when the Interborough subway strike in New York City placed a heavy additional burden on the surface lines, the Police Department promulgated strict no-parking regulations to facilitate traffic movement. Remarkable success attended the execution of this plan. A million extra passengers a day were accommodated above ground without any serious difficulty.

Fifth Avenue, where traffic congestion has long been a serious problem, furnishes an excellent example of improvement. Vehicles now move in each direction in three lanes instead of two as used to be the case. Buses move in a column close to the curb instead of weaving in and out. It is no longer necessary to discharge passengers in the middle of the roadway because of the impossibility of drawing up to the sidewalk. The average speed of private automobiles is practically double what it was with parking.

Similar good results have been obtained on other streets. If this eminently sensible restriction of parking is continued after the termination of the strike, the considerable inconvenience occasioned by the curtailment of subway service will be more than made up for by the permanent improvement in surface transportation conditions.

Hope for the Industry Seen in Aggressive Effort of Competitors

SOME good in the active competition affecting practically all electric railways today is seen by Charles E. Thompson, vice-president of the Chicago, North Shore & Milwaukee Railroad. He sees encouragement in this competition because the competitor realizes the essentiality of transportation.

The electric railway manager and owner has not been aroused entirely from the lethargy brought on by the first appearance of that competition. The transition from a comfortable monopoly to a competitive industry has brought a change in managerial conception from inwardly watching the wheels go round to one of looking outwardly to see how the wheels of his own vehicles can serve the public better than the other fellow's.

In short, it means a change from the swivel chair to the street. And some are loath to make the change.

In his address before the Central Electric Railway Accountants' Association at Chicago, Mr. Thompson further said that "no one cares to bother about a business headed toward oblivion." Facts of the last months have shown that the industry is headed toward oblivion only in the minds of the halt and the blind. Forward-looking cities, such as Cleveland, Chicago, Milwaukee, Cincinnati, Grand Rapids, Pittsburgh, Youngstown and many others, have seen through the mist of the present day and have dared to take the step to recreate and put their properties on a parity with the modern conception of a transport system. Some have accomplished results and others are in the process.

In the light of such real accomplishments, Mr. Thompson's address strikes home as indicating the dividing line between the old and the new. Primarily it is not cars and track that make a railway—they are only the physical tools of the industry. The attitude back of them is the real thing that counts. Mental apathy is the fundamental barrier that blocks the way and prevents the acquisition of a directed energy so necessary to recreate our public transport systems.

If the actions of our competitors will accomplish only the thorough awakening of the industry and its owners, then the temporary losses in revenue can be transferred to the capital account of the new company as an asset of no mean value.

Old Car Bodies Make Poor Waiting Rooms

COMMENDABLE anxiety to save money sometimes leads railway managements to adopt practices of doubtful desirability. For example, it is not unusual to see an old car body being used as a passenger waiting room. In point of first cost, this is perhaps the cheapest form of protection that could be provided. But it is a "penny wise and pound foolish" policy.

Surveys have shown that more than a third of the electric railway cars now in service are over twenty years old. Since this is so, it is safe to say that a car which has been retired as obsolete is not good for much. Since the requirements for a transportation vehicle differ widely from those of a stationary shelter a new car would make a poor enough waiting room, but an old car is worse.

Attractive modern cars are operated with a view to encouraging more passengers to ride. It is utterly illogical at the same time to repel people by expecting them to use worn-out, decrepit, old car bodies as waiting rooms. If need exists for some sort of shelter or station it is far better and cheaper in the long run for

the railway to build an adequate structure designed for this particular purpose.

Besides the lack of suitability from the standpoint of design there are serious objections from a psychological standpoint to making such use of old rolling stock. When a car has become obsolete it should be removed permanently from sight. It should not be allowed to stand rotting and rusting on some siding to remind passers-by that its days of usefulness are over. That is too much like suggesting that the day of usefulness of the electric railway itself is over. No doubt it would be over, too, if it relied on obsolete cars to carry its passengers. But the industry as a whole has made real progress in improving its rolling stock. The less the public sees of the old cars, the more definite will be the impression of modernization.

Planting the Seed Where the Soil Is Richest

NAPOLÉON owed much of his success as a military leader to the skill he employed in selecting the weak point in his adversary's defenses in which to drive an opening wedge. So today, in the campaign to stimulate car purchases by electric railways, it is well to determine at what point the most effective work can be accomplished in furthering the modernization program. It is not enough merely to say "buy new cars." Equally essential is the need for unification of car design, the simplification of car funding plans, and all such subjects dealing with the acquisition of rolling stock.

What would seem to be a promising point at which to start this entering wedge is the holding or management corporation, with its group of subsidiary railway properties and the important rôle which it plays in determining the buying policies of those companies. That there is fertile ground for work in this direction is indicated by the recent policy of one of these parent companies in ordering cars for several of its subsidiary properties. The cars were all built by one manufacturer, they were practically similar in general design and in specified equipment, yet the over-all dimensions on the cars for each of the properties varied by amounts not exceeding two or three inches. These variations, however slight, were sufficient to render impossible any attempt to standardize on the manufacture of these cars and the expense to the purchaser was accordingly increased very materially. It is possible, albeit not very probable, that these differences in dimensions were rendered essential by local operating conditions. The reason should indeed have been a substantial one to warrant departure from a standard specification, especially when the number of cars ordered for each property was small.

The A.E.R.A. special committee on essential features of modern cars has rendered its report. It goes without saying that in the adoption of its recommendations will lie the solution of many of the car purchasing ills which have beset the industry in the past. The advantage of strong leaders cannot be gainsaid, and if the holding companies and the management corporations take the initiative in the move to simplify car specifications they will have a strong influence in causing individual companies of the industry to fall into line. The issue is a crucial one and only a broad-minded and far-seeing attitude on the part of railway managements will assure an ultimately satisfactory outcome. It is time for the submersion of personal ego by individual com-

panies and executives and the working together of the whole for the good of all. As in 1776, "United we stand—divided we fall."

State Regulation of Highway Traffic Essentially Upheld

PUBLICATION in full in the legal reporters of the opinion of United States Supreme Court in the case of *Frost et al. vs. Railroad Commission of the State of California*, decided June 7, with the dissenting opinions, helps to a better understanding of the case. Thus, it shows that the Supreme Court did not declare that a state cannot require private carriers to take out certificates of convenience and necessity from the Public Service Commission or that the commission did not have power to regulate their rates. The criticism of the Supreme Court was directed against the attempt of the commission to enforce such regulation under the act as passed. This act was limited by its wording to "common carriers," which are words which have a very definite meaning in law. When, therefore, the Railroad Commission of California tried to regulate a private carrier under this law, the United States Supreme Court declared that it had exceeded its authority, saying: "A private carrier cannot be converted against his will into a common carrier by mere legislative command," nor can the state require a private carrier to give up his rights as such in order to use the highways. The United States Supreme Court does not say, however, that a law specifically covering private carriers, but in all other respects exactly like the present law, would be unconstitutional.

This fact is emphasized in the dissenting opinions filed at the same time. One was written by Justice Holmes and is concurred in by Justice Brandeis. The second is by Justice McReynolds. The former foresees a great deal of legislation by states for keeping streets reasonably clear for travel and sees nothing to prevent it from requiring every user of the street to take out a license. Justices Holmes and Brandeis differ principally from the majority opinion in finding nothing in the act which requires private carriers to become common carriers, but if there is such a requirement, they say, this clause could be declared invalid and the rest of the act allowed to stand. Justice McReynolds goes even farther, saying that if the California Supreme Court had simply approved the action of the Railroad Commission and had said nothing more, there would be little, if any, difficulty in finding adequate grounds for affirming its decision by the federal Supreme Court. He added that having built and paid for the roads, the State of California certainly has the general power of control over them, and if the state legislature had said that no intrastate carriers for hire except public ones should be permitted to operate over the state roads, it would have violated no federal law.

In other words, the conclusion reached from reading this decision is that all members of the court realize the growing necessity for greater regulation of street traffic by local authorities, and that the majority found fault with the wording, but not with the essence, of the act by which the state attempted to exercise this control.

One sometimes hears statements to the effect that the highways have been dedicated for public use and that laws on parking, speed regulation, varying rates of taxes for different classes of vehicles, etc., contravene some inalienable right of the citizens. It is sufficient

to say that no such view has been expressed in this last decision of the United States Supreme Court or in any other that can be recalled.

The "blind spot," or land of no jurisdiction, in the whole regulation of highways now is the case of the motor bus which does an exclusively interstate business. The trouble here, of course, is not with the courts but with Congress, because it has failed to act in this matter as yet. In the meantime, both federal and state courts have been defining more closely just what limitations may be placed by state legislatures on the activities of interstate motor buses. Briefly, these are some of them:

An interstate motor bus cannot do any intrastate business on any part of its route without the consent of the state concerned; that is to say, it cannot receive and discharge the same passenger or passengers for travel wholly within the boundaries of one state. The intrastate operator must also obey the local laws governing speed, safety and weight of his vehicles and must pay reasonable taxes on them. The word "reasonable" means presumably the taxes paid by like vehicles in intrastate business for like use of the road.

Some of the things which the individual state cannot do are as follows: It cannot withhold a license for a bus intended for purely interstate business because on parts of the route it is in competition with an existing route (Buck-Kuykendall case), and it cannot place upon an interstate private carrier the duties and liabilities of an intrastate common carrier (Michigan-Duke case). Where a common carrier does both an interstate and an intrastate business, the latter with the approval of the state, there is some question as to the possible extent of the latter control, but the power of a state to deal absolutely with its internal commerce is generally recognized except where such state action is clearly a burden or restriction upon the carrier's interstate business. Those wishing an extensive review of recent decisions on this general subject will find it in an opinion given by the New Hampshire Supreme Court on May 7 in the case of Hazelton vs. Interstate Bus Lines (133 Atlantic Rep., 451).

Possibilities Exist for

Getting the Summer Business

BACK some years ago the season of warm nights and warmer days induced people to take a trolley ride to cool off. Maybe there are a few such folks left, who would be tempted to partake of the pleasures of facing the breeze in a comfortable, safe and roomy vehicle, if they were reminded that the way was still open to them.

It can't quite be true that these folks have all gone for a dash in their flivvers. One thing that shows that summer business is still a big factor is the scramble for the upper seats on the double-deck buses. Such vehicles are no longer confined to Fifth Avenue in New York and Michigan Boulevard in Chicago, but they may be found in quite a number of cities of half a million population and even smaller. Buses are well adapted to taking care of the special summer routes. It may be desirable to run special Sunday and holiday routes to picnic grounds, the zoo and similar places to get the last bit of summer business. Extra dollars obtained in this way help to pay dividends.

In many cases it may be felt that the transportation business should normally drop off during the summer

with so many of the regular rush-hour riders on their vacations. Those who do not leave town will have more time to ride in the off-peak hours; and summer visitors should in some measure compensate for those who leave for recreation elsewhere. Posters and advertising may be used to good advantage to tell of the ways prepared by the railway to make the irritable summer days easier for those in town. Summer route buses may in some cases be run through the center of town so that they will be convenient and inviting.

While buses are the facilities needed for the special and occasional routes for which the company cannot afford to lay track, the street car has its possibilities for summer business. Band concerts and ball games are sources of off-peak traffic. It is well to advertise somebody else's business if it is going to help one's own. The people can be told just how to reach such gatherings by trolley, and in case of an especially big event the patrons may be given a pleasant surprise by running through cars from the heavier lines.

Special Care Needed in Long Run Chartered Bus Service

NEEED of great care in the operation of buses, especially in special and long run service, is emphasized again in the accident at Sparkill, N. Y., on July 22, when a chartered bus overturned, killing eleven passengers and injuring 33. The party was one of women and children returning to Brooklyn after an outing at Bear Mountain Park, and the cause apparently was too rapid descent of a hill, at the foot of which was a sharp curve. The evidence so far presented as to the detailed causes of the accident is somewhat confused, but it appears that the driver was not very well acquainted with the road and that the bus was not one originally designed for cross-country passenger service. It had a truck chassis built in 1918, on which a body capable of holding 40 passengers had later been placed. As electric railway companies are engaging extensively in bus operating, including chartered service, they should endeavor to heed any lessons which this accident may teach. This is the only good which can come out of the catastrophe.

Bus operation is an important part of the service which common carriers can give, but it demands great care in the selection and maintenance of equipment and in the training of operators. Whether these demands are in greater amount or proportion than in railway operation is beside the question just now. At least the operating problems are different, particularly in cross-country runs. Steep grades are apt to become slippery after a shower, sharp curves abound, and at any moment another user of the highway may pass directly in front of an oncoming bus.

That service can be given in these circumstances at fairly high speeds without serious liability of accident is being proved, of course, every day all over the country, but this is no reason for the neglect of great precautions, particularly in chartered service over unfamiliar routes. It is not every driver of an automobile that can be intrusted with the operation of a bus, nor should equipment unsuitable to the service be used. Responsible carriers will also gain if greater safeguards than now exist in many states are thrown around the service by the constituted authorities, these safeguards to include adequate responsibility for injuries caused.

Housing Facilities for Public Service Buses



THE view at the top shows the Lake Street garage, which is the largest operating station in the Essex division and houses 140 buses. It was built on the site of an open car storage yard. Four doorways give access to the street on three sides.

The oval shows the interior of the Sherman Avenue garage, which was originally built for industrial purposes. It has been rearranged to accommodate 128 buses.

The lower view shows the rear entrance of the Sherman Avenue garage, the second largest unit in the Essex division.



Public Service gas-electric buses handle heavy traffic on Broad Street, Newark. Two types of body are used—those built by the Yellow Truck & Coach Manufacturing Company and those built in the railway shops.

Public Service Standardizes Bus Equipment

Since the Delivery of 387 New Gas-Electrics More than 400 Vehicles of Older Types Have Been Retired from Service—At Present 843 Buses Are Operated on 99 Routes—Only Yellow Coaches, Whites and Macks Are Used

PURCHASE of 387 gas-electric buses by the Public Service Transportation Company, a subsidiary of the Public Service Railway, Newark, N. J., has made it possible to retire from service more than 400 vehicles of older types and to standardize on only four models. These are Yellow gas-electrics, Yellow mechanical drives, Whites and Macks. Standardization of equipment was one of the underlying reasons for the placing last December of an order for 333 gas-electrics, the largest single bus order on record. Later this was supplemented by an order for 54 additional vehicles of the same type. Delivery of these new buses has been completed and the obsolete vehicles formerly used have been scrapped.

Originally this company had more than 60 different types of buses. These had been bought during a period of several years, one at a time or in small groups from independent operators competing with the railway. It was a little more than two years ago that the company commenced bus operation on a large scale and many new buses, mostly Whites, Macks and Yellow Coaches with mechanical drive, were ordered from the manufacturers to replace the worn-out vehicles taken over from the independents. By this means a reduction in the number of types from 60 to 35 was effected. Recently 31 other types have been eliminated, so that there now remain

only four types in regular service. The number of each is shown in the following table:

RECAPITULATION OF BUS EQUIPMENT	
Type	Number
Yellow Coach, gas-electric.....	387
Yellow Coach, mechanical drive.....	102
White.....	229
Mack.....	231
Miscellaneous.....	22
Total.....	971

The 22 buses listed as miscellaneous are the result of the recent purchase of several existing lines. The equipment on these routes will be standardized as

quickly as possible. Present schedules call for the operation of 843 buses on 99 routes. These figures show a substantial increase over those of last fall as given in an article in *ELECTRIC RAILWAY JOURNAL*, Nov. 28. A total of 25 garages are used. The operation is distributed among the various garages in the six divisions of the company as shown in the table on page 176.

Acquisition of the 387 new gas-electric buses has made it possible to standardize the rolling stock by lines and also by garages. In Essex, the largest of the operating divisions, this has been carried out to a greater extent than in the other divisions. The two largest garages—Lake Street, from



Bus Service in Essex Division Is Given by 22 Lines Operating from Seven Garages



The Forward Part of the Benedict Body Has Longitudinal Seats, Thus Providing Space for Passengers to Stand When Paying Fare, etc.

which four routes are operated, and Sherman Avenue, serving five lines—have been completely equipped with gas-electrics. Orange and Passaic Valley garage, one of the smaller units in Essex division, also has all gas-electrics. The third largest garage, Hilton, has standardized on Yellow mechanical-drive buses. Other garages in this division are equipped with Yellow mechanical-drive buses and Whites.

Outside of Essex division it has been found impracticable completely to standardize the equipment of the various garages. For example, in the Passaic division the largest garage is at Paterson, with twenty lines and 109 buses. Such a wide variety of operating conditions are encountered on these lines that it was not considered desirable to select a single type of bus for service on all of them. Equipment of the individual lines, however, has been standardized. Some routes have been equipped entirely with gas-electric buses, some with Yellow mechanical-drive buses and others with Whites. Mack buses are used extensively in the Central division.

The Southern division presents a situation somewhat similar to that of the Passaic division. Thirteen routes are operated from Newton Avenue garage, utilizing a

DISTRIBUTION BY DIVISIONS

Garage	Capacity	Routes	Buses
Essex Division (7)			
Lake Street.....	140	4	74
Sherman Avenue.....	110	5	65
Hilton.....	85	4	77
Orange & Passaic Valley.....	25	2	17
City Line.....	36	4	21
Grove Street.....	40	2	34
Eighteenth Street.....	26	1	28
Totals.....	462	22	316
Hudson Division (1)			
Union City.....	100	7	83
Passaic Division (3)			
Paterson.....	130	20	109
Lakeview.....	40	4	30
Great Notch.....	30	2	25
Totals.....	200	26	164
Central Division (5)			
Elizabeth.....	40	5	28
Plainfield.....	40	4	16
Rahway Avenue.....	35	3	14
New Brunswick.....	70	7	51
Manville.....	3	2	4
Totals.....	188	21	113
Southern (6)			
Newton Avenue.....	130	13	105
Gibbstown.....	8	1	6
Berlin.....	15	1	13
Grenlock.....	20	1	15
Williamstown.....	6	1	4
Hainesport.....	6	1	4
Totals.....	179	17	143
Bergen Division (3)			
Rutherford.....	10	2	12
Hackensack.....	5	2	4
Edgewater.....	5	2	4
Totals.....	20	6	24
Grand total.....	1,149	99	843

total of 105 buses. Approximately one-quarter of these are of the new gas-electric type. In this division, however, the practice of standardizing the equipment by lines has not been followed as was done in the Passaic division. On the contrary, one or more of the gas-electrics has been assigned to nearly every line. Bus routes in the Southern division radiate from Camden to numerous outlying towns and this course was pursued in order to avoid criticism.

Bus operation in the Hudson division is conducted from the Union City garage, accommodating seven lines with 83 buses. Two of these lines, the Hillside and the Bergen routes, have been completely equipped with gas-electrics. In all divisions a total of 38 lines have been equipped wholly or in part with gas-electric buses.

Great progress has been made by the company during the past two years in providing adequate garage facilities for its buses. At first, spare room in the



Carefully Designed Roof Trusses Render Interior of Lake Street Garage Remarkably Free

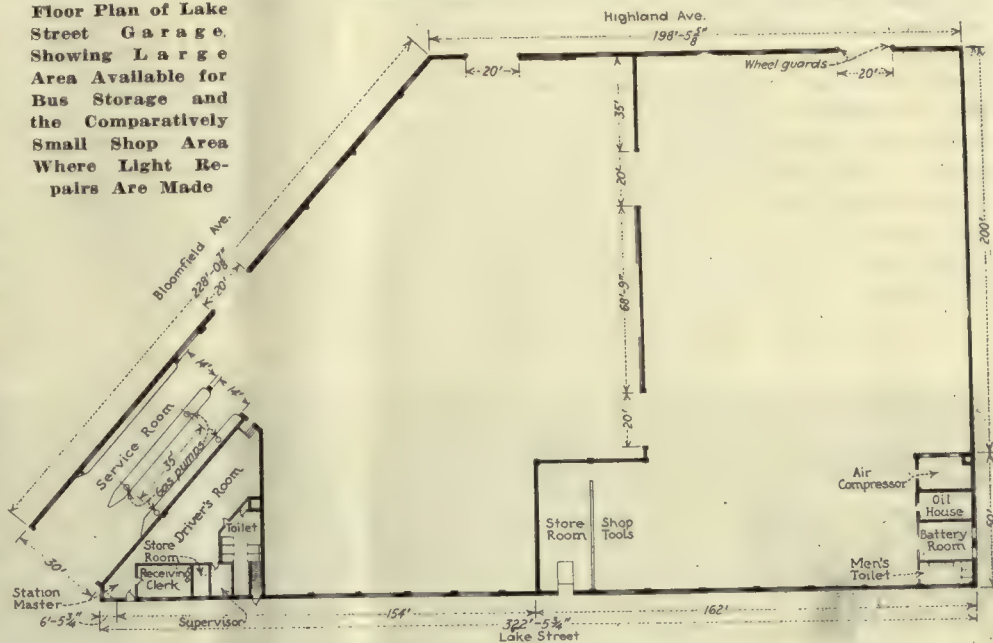
various carhouses was utilized to accommodate these vehicles. As the scope of bus operation was extended, however, it became necessary to provide more room, and a number of large garages were built or purchased.

Of these the largest is the Lake Street garage in Newark, with a capacity of 140 buses. This is a new structure built on the site of an old open car storage yard. The location is convenient to the four routes which are operated from it, one passing by the door and the three others being but a short distance away. An accompanying illustration shows the attractive exterior appearance of this building. Sherman Avenue garage, the second largest in Newark, is a large industrial building which has been converted for use as a garage. This is the case also at Paterson. At Hilton and Newton Avenues, on the other hand, garage space has been secured by reconstructing parts of existing carhouses.

At present the company is using a somewhat larger number of buildings for garage purposes than will be needed after the completion of certain new structures already planned. This contemplated reduction in number of garages will increase the benefit derived from standardization.

Considerable variety is encountered in the operating conditions on the various lines using the new buses. For example, in the Essex division the Bloomfield, Market Street and Summer Avenue lines operating from Lake Street garage, the North Newark, Weequahic, Lyons Avenue and Kearny lines operating from Sherman Avenue garage, and the Ampere line from Orange and Passaic Valley garage are all heavy traffic routes through closely built-up territory. To a considerable extent they parallel railway lines, and in these instances the gas-electric buses are performing a service similar to that of the street cars.

Floor Plan of Lake Street Garage. Showing Large Area Available for Bus Storage and the Comparatively Small Shop Area Where Light Repairs Are Made



Cross-Seats Occupy the Rear Half of the Body. Note the Emergency Door in the Center of the Back

On the other hand, gas-electrics are used on the Orange crosstown line, a suburban feeder route, where traffic is light. The reason for this, however, is to per-



from Columns. Gas-Electric Buses Are Standard Equipment for All Lines Housed Here



A Comparatively Flat Roof and Windows with Stationary Upper Sash Are Features of the Benedict Body Built in the Railway Shops

mit standardization of equipment at the O. & P. V. garage.

The routes selected for gas-electric operation in the Passaic division are generally similar to those already mentioned in Essex division. In the Central division gas-electric buses are used on long interurban routes, from New Brunswick to South Amboy and from New Brunswick to Perth Amboy. A similar use of these buses in interurban service occurs in the Hudson division on the route from Hackensack to Weehawken.

To a slight extent the distribution of new buses has been influenced by competitive conditions. Where independents have been operating on the same routes with the company buses frequently they have followed the practice of running a few seconds ahead of the Public Service vehicles to try to scoop up the greatest possible

number of passengers. By completely equipping such lines with the latest and the most attractive buses the company has been able to regain a great deal of this traffic.

COLOR HAS BEEN STANDARDIZED

Some time ago it was the general practice throughout New Jersey to have all the buses on each line painted a distinctive color. As most of these vehicles were owned by individuals with permits to operate only on one route no difficulty arose in connection with the transfer of a bus from one line to another. When the Public Service Transportation Company took over a large part of the operation, however, it was often found desirable to shift buses between routes. Moreover, the cost of painting various vehicles in different colors was con-



Buses and Cars of Public Service Railway Give Co-ordinated Transportation Service in Newark



By Utilizing Vacant Space for Parking Automobiles the Northern Texas Traction Company Induces Their Owners to Travel via Interurban to Fort Worth to Do Their Shopping

siderably in excess of that for painting the same vehicles a uniform color. The company, therefore adopted the policy of painting all its buses the same distinctive orange color which it had used for a number of years for the exterior of its cars. With the acquisition of the new gas-electrics and the retirement of 400 vehicles of older types the standardization of exterior color has been carried considerably further than ever before.

Identification of the route on which the bus is operating is now made by means of a large route number in place of the former distinctive route color. All buses have now been equipped with standard roller signs. These are divided into two parts. The left-hand side, as the prospective passenger faces an approaching bus, shows the route number. In the center is the name of the route in white letters on a black background. On the right in white on a red background is shown the destination of the particular trip. A similar sign of smaller dimensions has been placed on the side of the bus near the entrance door.

Standardization of bus bodies has also been carried out to a considerable extent. Bodies for some 200 of the latest order of gas-electrics were built in the Plank Road shops of the Public Service Railway, while the remainder were built by the Yellow Truck & Coach Manufacturing Company. Some points of difference exist between these two bodies, but they are generally similar. The seating arrangement follows the same general plan in all the buses recently purchased by this company. On both sides near the front are short longitudinal seats providing a space in which passengers can stand while paying fares or preparing to alight. Cross-seats are used in the rear part of the bus with short longitudinal seats over the wheel housings.

Free Parking Space Brings Business to Interurban

By A. J. ROWE

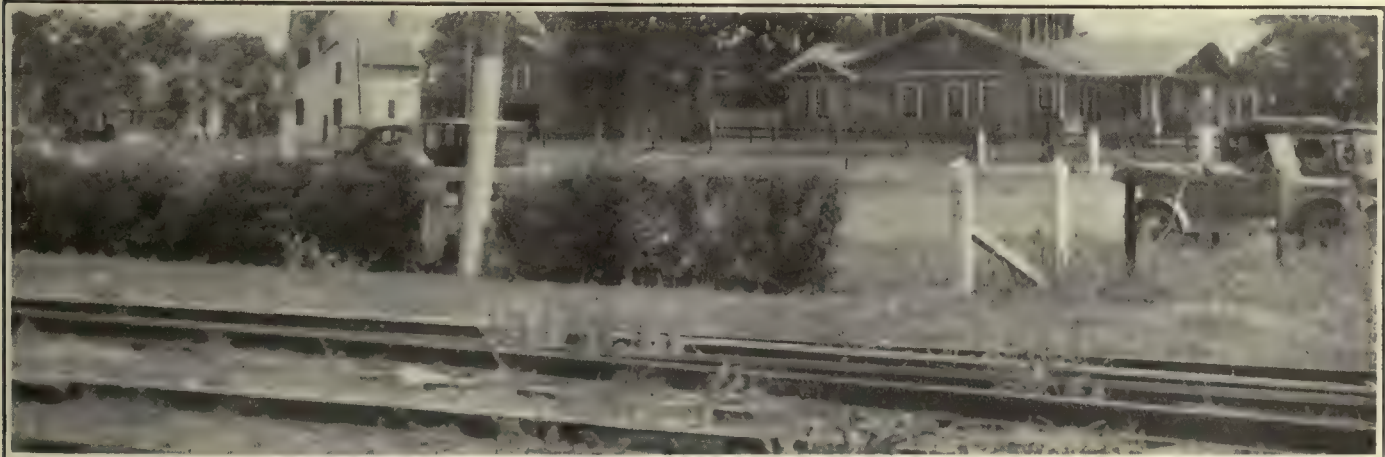
Northern Texas Traction Company

FOR the purpose of inducing patrons who live some distance from the interurban line to use the service a large, attractive parking station has been arranged just opposite the Handley interurban station of the Northern Texas Traction Company. The town of Handley is 8 miles from Fort Worth's business district, but is practically a suburb of the city. A neat fence, flowers and shrubbery make this space attractive and its proximity to the station affords sufficient protection that patrons leave their automobiles with all confidence, either night or day.

Difficulty in finding parking space in the city and the convenience of driving to the interurban, leaving their automobiles in the railway parking space and going to town, have developed quite a lot of new business for the interurban line from the residence section of Handley and the rural section surrounding this town. The number of autoists taking advantage of the station is gradually increasing. From ten to twenty vehicles can be found there at all times of the day, as shown by the accompanying illustrations, which were taken about noontime during a normal day. The additional space is needed on large days and at night when some special event is in progress in the city.

The cost of preparing this parking space was very small and the upkeep amounts to practically nothing.

In addition to furnishing a place for patrons to park, the station has improved the looks of the property,



The Parking Space Is Adjacent to the Northern Texas Traction Company's Tracks, Making It Very Convenient

added to the appearance of the town, and in this way has had a splendid effect from a public relations standpoint.

Instruction Books for Bus Men

The Wisconsin Motor Bus Line Gives Information to Educate Employees in Selling Better Transportation

TWO attractive books have just been issued by the Wisconsin Motor Bus Line, a subsidiary of the Milwaukee Electric Railway & Light Company. These are entitled "instruction books" and are distinctive from rule books. One is directed to city bus operators and the other to city bus collectors. The intent of these books is to educate both new and old employees in the art of selling better transportation. The text is replete with excellent messages that should inspire all operators in the performance of a better service.

Under the caption of "Serving the Public" the book issued to the city bus collectors reads as follows:

Our company is engaged in selling a very special kind of service to the public. The most important part of the collector's job is to assist in providing this service and to make it satisfactory to the passengers.

In many respects operating a bus line is just like any other business. Every business is dependent upon its customers to keep it going. If people do not buy the place must close its doors. With the bus line the same holds true. If passengers do not ride we will not have sufficient money to meet our expenses and we cannot continue to operate buses. In order to insure ourselves a large patronage and a successful business we must do everything in our power to give satisfaction to our customers. First, we want to attract people; then, when they patronize our buses, we should make their ride so pleasant that they will ride again.

In performing your duties as collectors you deal with the public as a representative of the company. You stand in place of the company, supplying its service and transacting its business and meeting its customers. To the passengers you are the company. Bear this in mind. Many people, especially strangers, will never meet any other representative of our organization but you. Their opinion of us and the service we render, as well as their attitude toward us, depends upon you. If you present an untidy appearance, if your bus is not clean, if you are reckless, grouchy, discourteous, or disagreeable and smart, you will surely create an unfavorable impression. But if you are neat, and if your bus is clean; if you are careful, business-like, pleasant, courteous, the passengers will think favorably of our company.

The book then goes on to give similar and intimate comments on the questions of courtesy, information, making announcements, destination signs and general conduct, and later on tells of the routine which is to be followed in the station, when taking out buses, and at the end of each line. The various signals and the method of making them are explained to the operator. The book is replete with line drawings, showing the proper position for a collector and the different positions, such as when operating from the top deck and in the usual position on the lower platform. Traffic signals are described in the text, as well as in small line drawings.

Detailed instructions are given in regard to the inspection of buses before they are taken out of the garage; the collection of fares and transfers, the making of traffic checks, filling out the trip cards, making change on the refund slips. Detailed description is given relative to accident and road delays.

In the back of the book sets of examination questions are given, all of which the operators are supposed to be able to answer intelligently.

The bus operator's book follows a similar plan, except that the text has been entirely rewritten, being directed at the work of the operator rather than the collector. Detailed instructions are given in regard to starting the engines of the different types of buses that are used and the handling of the different types of equipment. Instructions on the shifting of gears and "double clutching" are given. Likewise, detailed instructions are given for every condition that may be met, such as speed, skidding, overhead obstructions, pulling away from the curb, turning corners, intersections, silent police, safety zones, crossing and following vehicles, pedestrians, road trouble and accidents. To illustrate the nature of the text the paragraph on skidding is quoted:

There is no rule against skidding, but there is against careless driving, and skidding is the result of careless driving. When a bus skids it is not under control. The only skid that is ever controlled is the one that never gets started. A bus being properly operated will not skid. To prevent skidding when on a slippery pavement put the bus in low gear and travel slowly. The only safe speed is one which will allow you to stop instantly without skidding. If the bus shows a tendency to slide, keep the front wheels turned in the direction of the skid.

On slippery streets always go up to the stop with the bus in gear, never throw off the clutch if there is any danger of skidding. Let up on the accelerator and use the engine as a brake.

The city bus operator's book likewise has a list of 142 questions, all of which the operators are supposed to answer intelligently.

While these books are supposed to supplement the rule book, it is of interest to note that they are written in an unusual language rather than in the stereotyped manner of the old style rule book.

Early Purchase of Weekly Passes Capitalized in Pittsburgh

CO-ORDINATION in a new form has been illustrated in Pittsburgh, this time between two affiliated companies. Announcement has just been made in the *Transit Guest* as well as in the poster herewith reproduced that those

people who buy the weekly pass during the three days before they become effective will receive a coupon which is good for 50 cents toward the purchase of an electrical appliance.

This double-barreled merchandising stunt is commendable as it at one time advertises the transportation facilities and encourages the use of electrical appliances in the home. Purchasing of the pass before Monday morning is also encouraged. Usually

**THE
EARLY BIRD--
GETS THE COUPON**

**To Each Purchaser of a
WEEKLY PASS
on Fridays, Saturdays or Sundays
After JUNE 1, a Coupon Will Be
Given, Which Is Good for
50 CENTS
Cash Value Toward the Purchase
of an Electrical Appliance.
Not More Than Four Coupons May
Be Used Toward the Purchase of
the June Appliance, an American
Beauty Iron. June Coupons Will
Be Valid Until September 1, 1926.**

GAS AND ELECTRIC SHOPS
435 SEVENTH AVENUE ALL BRANCH SHOPS

Pittsburgh Gives Premiums to Early Purchasers of Passes

the peak day on which purchases are made is Monday, and the peak hour is during the down trip that morning.

One Owner's Faith in the Trolley

A Major Factor in the Rehabilitation of the "Stream Line" Was the Inauguration of Improved Schedules to Give the Service Needed by the Communities Served—Headways Were Cut, with the Result that There Was a Material Increase in Patronage

THIRD ARTICLE



In Steubenville a High-Class Building Was Selected as the Location for the Waiting Room

CARRYING out the program of physical improvements on the Steubenville, East Liverpool & Beaver Valley Traction system referred to in detail in articles in this paper for June 26, page 1101, and July 3, page 15, made possible a material betterment in service. As regards the local lines, the following improvements were made:

On Oct. 25 of last year service over the main line between Midland and Wooster was put on a 30-minute headway by supplementing the interurban locals run hourly. On the same day, the local service between East Liverpool and Wellsville was increased from a 20-minute to a 15-minute headway while the running time was cut from 50 to 45 minutes. The over-all results indicate an increase in earnings, but the exact percentage cannot be given owing to the division of this business with interurban locals.

On Dec. 12 service on the La Belle route in Steubenville was doubled in going from twenty-minute to ten-minute headways. By January, the trolley revenue was more than 18 per cent ahead of the same period a year earlier and more than twice the earnings of the temporary motor-bus operation which preceded the reconstruction of this route. This line serves automobile-owning territory, which makes so prompt a response

gratifying indeed. The center-entrance cars on this route are being remodeled for one-man operation, as described in a previous article. The combination of lower costs and constantly rising patronage should soon make this route pay for its rehabilitation.

An interesting proof that the La Belle line's improved service has not yet sunk in thoroughly is the fact that during the first month of better headway the revenue from weekly passes comprised only 10 per cent of total revenue. On the other hand, the Fourth Street route in Steubenville, which has had a ten-minute headway for a long time, shows a 20 per cent revenue ratio from passes. The pass sales are stimulated, of course, when the buyer knows that the headway is short enough to make luncheon riding convenient and also short enough to make him prefer the trolley to the automobile during his hours of voluntary travel.

On Jan. 10 service on the Grand View line in East Liverpool, a route serving the best residential area, was increased by changing from a 24-minute to a 15-minute headway, with an extra tripper in the afternoon. The very first week showed 14.2 per cent more revenue. Comparison of like parts of 1926 and 1925 show that Jan. 1-9, 1926, was 1 per cent under, while Jan. 10-16 was 7.5 per cent over, or an actual better-

EAST LIVERPOOL TO PITTSBURGH via P. & L. E. R. R. at Beaver (Eastern Standard Time)			
Car Leaves East Liverpool	Arrives Beaver	Train Leaves Beaver	Arrives Pittsburgh
a. m. 6:20	a. m. 6:15	a. m. 6:25	a. m. 7:00
7:10	7:05	7:15	7:45
8:15	8:10	8:20	8:55
9:25	9:20	9:30	10:05
10:35	10:30	10:40	11:15
11:45	11:40	11:50	12:45
12:55	12:50	1:00	1:35
1:45	1:40	1:50	2:25
2:35	2:30	2:40	3:15
3:25	3:20	3:30	4:05
4:15	4:10	4:20	4:55
5:05	5:00	5:10	5:45
5:55	5:50	6:00	6:35
6:45	6:40	6:50	7:25
7:35	7:30	7:40	8:15
8:25	8:20	8:30	9:05
9:15	9:10	9:20	9:55
10:05	10:00	10:10	10:45
10:55	10:50	11:00	11:35
11:45	11:40	11:50	12:35
12:45	12:40	12:50	1:25
1:15	1:10	1:20	2:15
2:05	2:00	2:10	2:55
2:55	2:50	3:00	3:45
3:45	3:40	3:50	4:35
4:35	4:30	4:40	5:25
5:25	5:20	5:30	6:15
6:15	6:10	6:20	7:05
7:05	7:00	7:10	7:55
7:55	7:50	8:00	8:45
8:45	8:40	8:50	9:35
9:35	9:30	9:40	10:25
10:25	10:20	10:30	11:15
11:15	11:10	11:20	12:05
12:05	12:00	12:10	1:00

*—Daily except Sunday. f—Flier

The Steubenville, East Liverpool & Beaver
Valley Traction Co.
EAST LIVERPOOL, OHIO

Corrected to May 12th, 1926
(Subject to Change Without Notice)



CONNECTIONS

Columbus
Best connections with Pennsylvania Trains at
Steubenville at 10:25 a.m.; 3:44 and 6:20 p.m.

Cleveland - Buffalo - Detroit
P. & L. E. R. R. at Beaver or Pennsylvania
at Wellsville

Lisbon - Leontonia - Youngstown
Salem - Canton
Y. & O. Railway every hour at East Liverpool

Wheeling and down river points
Wheeling Traction Company every half hour
at Steubenville

Pittsburgh
See detailed schedules on back of Time Table

The "Stream Line" Idea Has Been Emphasized on the Time-Tables
and Other Literature of the Company

ment of 8.5 per cent. Sales of weekly passes rose from 50 to 94 following the advent of better service and personal solicitation for business.

Service between East Liverpool and Chester was improved on Jan. 10 by going from fifteen-minute to ten-minute headways. So far this line has not responded as well as the others.

Also on Jan. 10 a 30-minute headway local service was added for a fifteen-minute run over main-line track passing through Toronto. The five week-day earnings had already attained about 15 cents per mile by Feb. 1, and it should not be long before this new service becomes self-sustaining.

Without going into further detail it may be stated that these changes are producing increasing benefits. For example, the seasonal decline of traffic was postponed to such a degree that April held level with December, January and February.

Perhaps the most interesting story relates to the interurban operation. Formerly, the standard service consisted of hourly cars which used two hours 45 minutes for the 43 miles between Beaver and Steubenville. On Feb. 18, 1925, there was instituted a limited car making only twelve stops for two round trips a day. This cut the running time to one hour 55 minutes between terminals. When the "Ceramic" started on Jan. 10, 1926, the time was cut to one hour 40 minutes, and now that the remaining road improvements have been completed the run is expected to be made in one hour 30 minutes. Meanwhile the running time of the locals has been cut from two hours 45 minutes to two hours 18 minutes.

The prompt response of the public to this improvement in speed alone has not only accelerated the rehabilitation of existing interurban cars, but has led the management to make plans for running limiteds every two hours instead of twice a day.

Summarizing the foregoing changes from the financial viewpoint, the following comes to light:

Revenue in the first ten months of 1925 was 10 per cent under the same period of 1924.

November and December, 1925, the first months of better service, ran even with similar months of 1924.

January, 1926, ran 6.2 per cent ahead of January, 1925. Thus within three months a loss of 10 per cent

has been changed to a gain of 6.2 per cent, an actual improvement of 16.2 per cent without the aid of materially better industrial conditions.

THE "CERAMIC" GETS THE CASH

The effect of the "Ceramic" on interurban revenues is worth separate examination. This car was placed on the line on Sunday, Jan. 10, of this year. As it is run eighteen hours a day instead of the twelve hours of the limited which preceded it, the following comparison has been reduced to an earnings-per-hour basis:

In the last eight days of the old car, the revenue per car-hour averaged \$6.61 and per car-mile 43 cents; while the "Ceramic" from Jan. 10 to Jan. 31 averaged \$11.42 per car-hour and 48 cents per car-mile. The relatively greater increase in revenue per car-hour is due to practical elimination of layovers.

The "Ceramic" would show still better on the bases of actual car-hours and car-miles if it were not being operated an additional six hours a day on leaner runs.

It is reasonable to assume that some of the "Ceramic" business was taken from other less attractive and slower cars. For all that, the net daily gain in interurban revenue is on the order of 9 per cent, comparing Jan. 2-9 against Jan. 10-31.

One of the significant facts about the operation of the "Ceramic" is not only the expected praise from the public for something faster, brighter and more comfortable, but the unexpected praise for the courtesy of the "Ceramic" crews. It would seem that finer cars make finer trainmen. The pride that the men feel in this rejuvenation is reflected in their bearing to the riding patrons.

To make the rank and file feel that jobs like the "Ceramic" are peculiarly their own, Mr. Wills did the unusual thing when the "Ceramic" made its trial run. Not a group of newspaper men and public officials were the first riders, but the very men whose craftsmanship had put the car together. The shopmen made the round trip between East Liverpool and Beaver, and next members of the office staff—including the volunteer embroiderers—had a ride to Steubenville.

It need hardly be mentioned that the advent of the



The East Liverpool Waiting Room. Attractive Electric Signs
Are Used to Draw Business

cream-colored "Ceramic" was a sensation to the public. Even after two weeks of operation, the cry "Attaboy" from the younger male generation standing along the highway gave evidence that people were still taking favorable notice. The finest motor coach could not have received a heartier reception; yet the "Ceramic" is just an eighteen-year car made over!

Publicity for the "Ceramic" was not merely local. The news was deemed interesting enough to get good

outstanding problems. The second pamphlet dealt with state problems, while the third struck home with a study of the specific problems of the local railway.

Aside from this distribution of educational booklets, the canvasser has the advantage of being able to advise the people visited about increased service on their local routes, improved cars, faster service on the interurban, the advent of the "Ceramic," etc. The fact that the weekly pass gives so much possible value to a regular

Rides north from zone beginning at station named																		Column B					
No. Zones Ridden	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Rides S. Rides N. (A+B)				
North End of Ride (Read horizontally)	Cash com.	56	176	91	261	315	1491	29	1161	144	2		1		24	18	2		205	A. Total of figures in this space horizontally	(A)	(B)	(C)
Sas. Alley	Cash com.	81	100	136	81	361	2	252	39	1			2	1	2	3	23			1084	257	1341	
Vanport	Cash com.	27	52	28	99	28	61	28	1					13		5				329	218	547	
Workmens	Cash com.	27	31	59	1	16	4	2												174	174		
Industry	Cash com.	143	335	82	164	23	3			2	2			12	(A) Rides south from zone beginning at station named				766	598	1364		
Midland	Cash com.	1565	220	3175	473			6		20	9	2		88	(B) Rides north from zone ending at station named				5558	3910	9468		
Smith's Ferry	Cash com.	1	115	608	26						5				(C) Total number rides originating or terminating in zone next south of station named				759	60	819		
State Line	Cash com.	121	369	46	19		10	14	2	18			7		C = A + B				605	483	1088		
Kountz	Cash com.	**625	1159	191	63	218	103	454	459	28	22	1765							5087	5823	10910		
Wellsville, S.	Cash com.	540	317	105	439	226	413	619	186	111	924	12							44	674	718		
Irondale	Cash com.	5	82	48	123	46	10	16	25	154									3880	2456	6336		
Taggerts (N. limits of No. 12)	Cash com.		261	272	123	1102	33	27	201										117	65	182		
Rocky Side (S. limits of No. 12)	Cash com.																		509	541	1050		
Minors	Cash com.																		1019	250	1269		
Meyers St.	Cash com.	21	534	300	486	77	85	333											1836	1004	2840		
Toronto S.	Cash com.	56	781	678	86	65	530	16											147	61	208		
Country Club	Cash com.	*1361	171	404	241	1701	23												2196	1323	3519		
City Limits	Cash com.																		44	16	60		
Steuben. 6th.	Cash com.																		4480	3528	8008		
South end of ride read up diagonals	See note	1	2	Zone 3	riders 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18				
Total No. of all or Multizone rides, (add vertically)	Cash com.	6165	7486	7168	6039	3180	2745	1779	2074	476	959	1769	8	90	37	20	10	23	205	40833	40833		
		1	122	750	300	30	122	81	1		12	5		13						1437	1437		

Analysis of Traffic on the Steubenville, East Liverpool & Beaver Valley Traction Company for the Period Sept. 25-Oct. 1, 1925, Shows the Total Number of Patrons Between All Zones During the Week

notices in the Pittsburgh papers, which are read by many a possible through customer.

Perhaps the most thought-provoking item is the statement of a local automobile dealer to a "Ceramic" conductor that: "If that's the kind of service you're going to give, I'm going to use it myself to save time and money."

HOUSE-TO-HOUSE CALLS TO CORRECT SERVICE DIFFICULTIES

Shortly after arrival, Mr. Wills took the radical step of determining the desires of the public through house-to-house canvassing. He employs one well-educated woman now for this work and may add one or two later as the need arises.

The first job of this caller was to leave a pamphlet on electric railways nationally considered, giving some idea of the extent of the industry and a review of its

rider and members of his family has also proved helpful to the canvasser because of her opportunity to appeal to the bargain instinct in humanity.

Following her canvass of Steubenville and East Liverpool homes this solicitor has begun to call on merchants and factory managers.

Through this canvasser the management is apprised as to why the public uses or does not use the service, and secures a good line on what improvements prospective riders desire in order to become customers. The novelty of having a railway come right up to their doors for patronage is most flattering to the public, and surely proves to them that the railway cannot be indifferent to their desires and that it cannot be making overmuch money at the fares and patronage prevailing.

The management also has secured liberal newspaper space for accounts of Mr. Wills' addresses before civic bodies, but in the last analysis it is the clerk and the

workman rather than the auto-owning and auto-using merchant who must be won over, too. Hence public relations work of this intimate kind deserves the importance it is receiving on this property.

FARES HAVE NOT RISEN IN PROPORTION TO COSTS

Like most other electric railways, this property has had "a sea of troubles" in seeking to secure fares that bore some livable relation to the depreciated dollar.

The first increase came at Chester in April, 1918, due to the good fortune, in this instance, that the East Liverpool-Chester route is subject to the Interstate Commerce Commission. The original through fare was 5 cents. It is now 10 cents to casuals, but semi-regular riders have practically a 7-cent fare through the purchase of fourteen tickets for \$1, while the weekly pass patrons enjoy the pre-war rate of 5 cents or less through the purchase of a \$1.25 pass and the doubling of their riding. A ride entirely within Chester may still be obtained for 5 cents cash.

In East Liverpool, the original 5-cent fare was increased in April, 1923, to 7 cents cash and four tickets for 25 cents. This fare covers a maximum unbroken ride of 6.67 miles along the main line between the State Line and Kountz. Transfer privileges are exchanged between the main line locals, Pleasant Heights, Grand View and River Road (bus) routes for 1 cent per transfer. Since the inauguration of the weekly pass July 6, 1925, \$1 has been charged for separate passes for each of these four routes and \$1.25 for a pass good on all of them. During March, 1926, the pass rate was cut to \$1, thereby eliminating four varieties and immediately increasing the attractiveness of the pass idea to the public by some 50 per cent.

Over the Toronto stretch of main line, the original franchise fare of 5 cents and thirteen tickets for 50 cents was succeeded in April, 1924, by a 7-cent cash fare, but regular riders can enjoy a 5-cent fare by buying twenty tickets for \$1.

In Steubenville, the local fare was increased from 5 cents cash and six tickets for 25 cents to 6 cents and twenty tickets for \$1 early in 1922; and in May, 1923, to 7 cents cash and 6½-cent ticket. Transfers are free. The \$1 weekly pass used in Steubenville is available on the two local lines, but not on the interurban.

Local film managers have helped pass sales by special concessions to passholders, realizing that passholders may bring others.

Higher fares on the interurban railway have been even harder to secure because of the varying viewpoints of two state commissions (Pennsylvania and Ohio) and local insistence on old franchise stipulations. While the rate is 5 cents per zone, the lengths of zone vary from 0.88 mile to 6.67 miles for the eighteen zones in the 43 miles between Beaver and Steubenville.

It would hardly be desirable to go into the changes in zones made since pre-war days, except to observe that two zones were added through splitting up extra long zones. One such burden was an 11-mile zone between the Pennsylvania-Ohio state line and Wellsville. An idea of the scant relief so far obtained may be gained from the knowledge that the pre-war rate between Steubenville and Beaver was 85 cents, and it is now only 95 cents.

In spite of all this, the company is going ahead with a vastly improved service in the faith that the commissions and the public will do what is right.

In compiling data to show the origin and destination of every ride taking place on the interurban lines the

company has developed an original method. The data sheet which is reproduced to accompany this article is typical of the system employed. Full information is given in this sheet as to rides in a southerly or northerly direction in any zone, the total number of rides originating and terminating in any zone, the length of ride taken from any zone (see example for reading detail traffic figures) and the actual number of rides of all classes from one zone to the total length of the system, including eighteen zones. It will be noted that the bulk of receipts are derived from rides up to and including eleven zones in length and that thereafter the number of rides taken is relatively small. Thus it has been possible for the company to rearrange its zoning system to increase the cash fares but to decrease the rates charged for the longer rides.

This has resulted in the establishment of a "leader" in the company's sales policy. In other words, high discount rates for long rides have been proffered to encourage more shopping in the larger towns, such as East Liverpool and Steubenville. This is a somewhat similar scheme to the practice adopted by many department stores of featuring one or more articles at especially attractive prices. The company stands to lose very little even though its regular patrons should avail themselves of this lower discount rate, for after all the receipts from the long-distance haulage constitute but a small share of the total gross income.

While the railway has made it a policy to co-operate with the merchants in the various communities served in the matter of stimulating interest in "Dollar Days" and other special occasion sales, the actual effect on receipts the year round from this sort of practice is not of a material character. No arrangement is entered into by the company unless the merchants' associations agree that it will be a permanent undertaking.

CHANGES IN UPKEEP ORGANIZATION GET INDIVIDUAL RESPONSIBILITY FROM SPECIALISTS

Greater specialization in upkeep has been introduced lately to assure better work and closer responsibility. There is now a signal and telephone specialist and a bridge specialist; also one welding and cutting specialist for each half of the system. These men are on a salary basis with no fixed hours. The amount of night and holiday leisure they enjoy is largely according to their skill in forestalling breakdowns.

The bridge specialist devotes his efforts to the inspection and upkeep of bridges, viaducts and related structures. No limit has been placed on his requirements for any materials needed to keep his structure both safe and presentable. It is appreciated that a rusty-looking bridge may be 100 per cent safe and yet look suspicious to the car rider.

The two utility men, who are welding and cutting specialists primarily, are each supplied with a Reo 2½-ton speed wagon for tools and materials. These men see that the work gangs are furnished necessary supplies, have tools properly ground or sharpened, etc. Their main work, however, is to supervise the track and return circuit conditions. To this end they are equipped with electric weld bond equipment and oxy-acetylene cutting torches. They are subject to call by gang foremen in case broken rails have to be cut off, missing bonds replaced, special work laid, new metal welded on to worn curves, or any other jobs calling for their specialized skill. On rainy days these men stay in the shops to make thermit compromise welds which are replacing bolted joints.



Inspecting the New Interurban Car at Stone Mountain, Ga.

Dedication of Interurban Cars in Georgia Is Civic Event

Many Prominent Citizens Are Present as the Georgia Railway & Power Company Inaugurates Its Improved Service—The Ten Cars Are Named for Prominent Figures in the State's History—The New Equipment Is the Last Word in Modern Design

DEVELOPING a notable demonstration of the good will existing between the Georgia Railway & Power Company and the public served by its two principal interurban lines, ten new cars recently put in operation on interurban lines near Atlanta were formally dedicated for the service in ceremonies held at the two terminal points, Marietta, Ga., and Stone Mountain, Ga., on June 24 and June 25 respectively.

City officials of the communities served by the two lines, including the mayors of the principal towns, members of the city councils, with members of the governing boards of the counties traversed and members of the state Legislature representing the counties, in addition to civic club officers, participated in the ceremonies and, speaking for their constituents and communities, paid warm tribute to the spirit of service shown by the company. They urged a continuance of friendly co-operation between the company and its patrons and solicited patronage for the company to enable it to continue the program of improvements it has inaugurated with the ten new type cars as one new feature.

Nearly 1,000 persons were in attendance at the ceremonies in the two towns, according to estimates of Atlanta newspaper representatives who reported the function, and many more gathered at the stations of

intermediate points along the line to greet the first of the new cars, carrying officials to the celebrations.

At the Marietta dedication, Mayor E. R. Hunt of Marietta officially accepted the new cars for his city, with Mayor Sims of Atlanta, Dr. M. B. Hodges, president of the Marietta Chamber of Commerce; Fred Morris of the Kenesaw Mountain Memorial Association and Charles Brown, Mayor pro tem and president of the Marietta Rotary Club, among other speakers, Mr. Brown presided. F. L. Butler, vice-president of the Georgia Railway & Power Company, presented the cars, stating that they formed a first step in a program of interurban transportation improvements.

At the Stone Mountain ceremonies, Mayor Scott Candler of Decatur, the largest municipality served by the Stone Mountain line; State Senator Carl N. Guess, of the senatorial district traversed by the interurban, and officials of Clarkston, Scottdale and other smaller stations were speakers, in addition to Mayor Sims of Atlanta and Mr. Butler. Senator Guess presided, opening the ceremonies with a verbal appreciation of the company's service in developing the northern section of Georgia.

The speakers all emphasized co-operation as the key to progress, signaling the improved interurban service as an evidence of the fruitfulness of friendly understand-

ing of mutual problems.

The Atlanta *Constitution*, commenting on the ceremonies, said, "Trolleying de luxe—! which means rapid and comfortable transportation and better interurban service. This is the new sport which will call to every resident living along the Marietta and Stone Mountain interurban lines, if the verdict of Mayor Walter A. Sims, members of City Council and others who on Thursday were guests of the Georgia Railway & Power Company aboard the first car the company ran on a 'trolley party' is sustained." Similarly favorable comments were made by other papers in the territory which the new cars will serve.

USE OF CARS

Five of the new cars will be used on the Stone Mountain line and the same number on the Marietta line. Eight other cars are being remodeled. It is intended to make use of this latter series of cars for rush-hour service on the Marietta line.

All the new cars are designated by name, the names and body striping being carried out in gold leaf on the sides of the cars. The names given the cars were selected by ballot of the passengers to memorialize citizens who had been outstanding in the development of the territory served by the two lines but are not now living.

The first car, used in both dedication ceremonies, is the "Peter Caldwell," named for the conductor who operated the first electric car of the Georgia Railway & Power Company on the Stone Mountain line and who served in that capacity for thirteen years until his retirement was forced by the ill health that led to his death last year.

Among the other prominent citizens of the territory whose memories were signally honored by having cars named after them were Joseph E. Brown, who was Georgia's Governor during the Civil War; Richard Peters, the "father of Atlanta's street railways"; Joel



View from the Front Side Door of the Control Equipment on One of the New Cars

Harris, who created the memorable character of "Uncle Remus," and A. Stephens Clay, for thirteen years a United States Senator from Georgia. The other men were equally noteworthy.

TECHNICAL DETAILS

The general design of the body is of the low-floor, two-step type with low arched roof and long straight lines predominating. The sides are of curved construction, being drawn in at the sills and roof line and gracefully curved to the vestibules at the platform door openings.

Both the front entrance and exit doors and the rear exit door are of the sliding type made of flexible panels hinged their entire length with continuous rod-type hinges. The steps are of the stationary type and are a permanent part of the platform underframing.

The corners of the body are finished with wide, substantial piers set off with round top double sash. As the cars are for single-end operation, the doors are located on the right-hand side only, and the left-hand sides of both platforms are fitted with raise sash. The cars are equipped for use in two-car operation, train doors being provided in the center of each vestibule end for this purpose.

The ends of the car are equipped with special wide, corrugated face, pressed steel bumpers, which add to the attractiveness and symmetry of the exterior and support the train door platform for permitting passage between cars.

CARS HAVE STEEL SUPERSTRUCTURES

The underframe and superstructure of the car are of steel with a curved plate extending from the sill to the rail, forming parallel girders for supporting the body. The roof and letterboard are of wood and are supported by the steel piers at the corners of the body. The window posts are of wood and extend from belt rail to letterboard, being fastened to belt rail, letterboard and roof carlines with bolts through aluminum brackets.

Details of Equipment of the New Georgia Interurban Car

Builder of body...Cincinnati Car Company
Type of car.....Single-end, double-truck
interurban safety car for two-car
train service
BodyAll steel
Interior trimLight mahogany
HeadliningAgasote
Air brakes and compressors.....Westinghouse
Car signal system.....Faraday
Car trimmings.....Bronze oxidized, Dayton
Center and side bearings.....Brill, center
bearings; Stucki, side bearings
Control.....General Electric PC 5-K2
Couplers.....Tomlinson, Form 10, car,
air and electric

Curtain fixtures....Curtain Supply No. 90,
pinch fixture, Rex rollers
Curtain material.....Fantasote, grain
morocco, color No. 86
Destination signs.....Keystone JRR and ILR
Door-operating mechanism.....National
Pneumatic
Energy-saving deviceEconomy meter
Fenders.....H-B wheelguards
Gears and pinions.....General Electric A-1
Hand brakesPeacock staffless
Heater equipment.....Consolidated Car Heating
Headlights.....Ohio Brass SDH roof type
Journal boxesBrill
Lightning arresters.....General Electric
aluminum A-11

Motors.....Four GE-265-A, inside hung
RegistersOhmer
Safety devices.....Safety Car Devices Co.
Sanders.....Ohio Brass, Form 2
Sash fixtures.....Dayton Wedge type
Seats.....Hale & Kilburn 900A, bucket type
Slack adjuster.....American automatic
SpringsBrill Company
Step treads.....Aluminum, Cincinnati Car
Trolley retrievers.....Knutson 5-B
Trolley base.....Ohio Brass, Form 4
Trolley wheels.....Nuttall, 6 in. diameter
Trucks.....Brill 177-E-1
VentilatorsNichols-Lintern Company
type C



View from the Smoking Compartment Looking Into the Main Passenger Compartment



The Train Door in the Rear of One of the Cars Is Here Shown

Wood sash is provided, the top sash being in single sections, set stationary, and the bottom sash arranged to raise.

The body of the car is divided into a front main passenger and rear smoking compartments. A partition, framed of cherry, separates the two compartments and is fitted with large sash on each side of the aisle above the seats.

Special efforts were taken to make the interior of the car as comfortable and attractive as possible. The seats are of the double-bucket stationary design with deep spring construction and loose spring pads for each passenger. They are upholstered in gray Spanish leather of a soft and pleasing appearance. Felt padded arm rests are installed on the window stooling at each cross-seat.

The floor is covered with gray linoleum under the seats and with an aisle strip of 1½-in. checker red and green rubber tiling. This checkered design is also carried out on the platforms.

The ceiling is made of Agasote headlining, enameled

light cream, and trimmed in two-window sections with neat cherry moldings. The interior finish is of fine grained genuine cherry in natural finish.

Parcel racks, suitable for small parcels, coats, etc., and of the continuous rod type, are located along each frieze panel the full length of each compartment, and enameled a cherry color to harmonize with the interior finish.

Each compartment is effectively illuminated by decorative ceiling fixtures with large hemispherical Alba shades, equally spaced along the center of the ceiling, and harmonizing wall bracket lights located at advantageous points in each compartment. The main ceiling circuit lights are equipped with compensated fixtures to prevent the darkening of the car in case a lamp burns out.

Electric marker and classification lights are permanently located in the letterboard above each vestibule wing sash and wired with a relay switch to both trolley and battery so that the warning lights will be burning whether the trolley current is on or off. One battery



Side View of the "Peter Caldwell," the First of the Cars to Be Dedicated

lamp with hemispherical shade and fixture is located in the center of the ceiling in each compartment to provide some illumination in case of loss of the trolley current.

For aiding passengers in boarding the car, an illuminated "Enter at Front" sign is located in the lower part of the right-hand vestibule sash and controlled through a pneumatic switch so the lights in the sign burn only when the brakes are applied. There are illuminated destination signs in the upper right-hand corner of the front dash and at the top of the right-hand rear vestibule sash.

Ohmer fare registers have been installed, and in order to keep the ceiling as free from fixtures as possible, the registering rod and cord are carried in brackets on the front of the left-hand parcel rack.

Twelve exhaust type ventilators with grills and reg-

the operator from his position on the front platform. When operating as a two-car train, the motorman is located on the front platform of the first car and the conductor may be stationed at either the front end of the rear car or the rear end of the front car. The motorman on the front end has control of the front entrance and exit door of the first car, and the conductor has control, from either platform, of the rear door of the first car, and both front and rear doors of the rear car. By use of the train doors, the conductor is enabled to pass from one car to the other for collection of fares, as may be required. The train doors are safeguarded against use by passengers through a lock, the key of which is in the possession of the conductor. In train use the conductor can leave the door unlocked so that it can be opened by a knob from the outside, thus facilitating his passage between the two



Senator Carl N. Guess, Who Presided at the Stone Mountain Exercises, Addressing an Interested Audience

isters in the ceiling are equally spaced in two rows along the roof. There is also one adjustable intake ventilator in the hood of both front and rear vestibules, insuring ample ventilation.

In order that the passengers may be kept comfortable in cold weather, sixteen electric panel-type heaters, automatically controlled, are installed, eight along each side wall in a specially designed truss plank for supporting the heaters and seats. This panel has a rounded, sanitary corner at the floor line.

The steel side walls of the car are insulated against heat and cold, and body noises are eliminated by the application of 1-in. compressed cork boards, cemented directly to the inside of the steel plates and covered on the inside with linoleum panels forming the wainscoting and enameled to harmonize with the interior finish. The bolsters, which are of the pressed steel box type, are also insulated against noise by being filled by a ground cork and cement preparation.

The cars are designed and equipped for one or two-car train operation and with a crew of one or two men. When operating as one-man single units, the passengers enter through the front entrance door and leave through the front or rear exit doors, which are under control of

car platforms. All doors, except train doors, are controlled by electro-pneumatic door engines, which interlock with the controller through the line breaker and

GENERAL DIMENSIONS OF THE GEORGIA RAILWAY & POWER INTERURBAN

Length over all	45 ft. 6 in.
Length over dashers	44 ft. 6 in.
Length over body	33 ft. 6 in.
Length of platforms over dashers	5 ft. 6 in.
Bumper projection	6 in.
Rail to top of trolley boards	10 ft. 8 1/2 in.
Rail to underside of sill	28 1/2 in.
Height floor to headlining	7 ft. 5 1/2 in.
Extreme width	8 ft. 4 in.
Width at side sill	7 ft. 8 in.
Rail to first step	15 in.
First step to platform	14 in.
Ramp in car floor	3 1/2 in.
Vestibule door opening—front	4 ft. 2 in.
Vestibule door opening—rear	2 ft. 4 in.
Partition door opening	22 in.
Truck centers	26 ft. 3 in.
Wheelbase	5 ft. 4 in.
Diameter of wheels	26 in.
Post centers	33 in.
Width of aisle	21 in.
Width of seats	36 in.
Seating capacity	51
Weights	
Electrical equipment	7,489 lb.
Air brakes	1,775 lb.
Trucks	10,160 lb.
Body	18,576 lb.
Total	38,000 lb.

door engine switches, so the doors cannot be opened while the train is in motion and the train cannot be started while the doors are open.

The car bodies are mounted on the latest design of light-weight interurban type trucks with 26-in. rolled steel wheels. Each car is equipped with four 35-hp. motors and controlled by light-weight multiple-unit control for single-end operation. Single-end straight air brakes of the variable load type, and complete with all emergency features, are installed, which assures efficient braking at all speeds and passenger loads.

Each end of the car is equipped with a radial coupler designed for making, automatically, all air and electric connections when the cars are coupled in trains, and a special switch for breaking all electrical connections when the cars are uncoupled.

The front end of each car is equipped with two headlights. There is a main, high-powered headlight on the roof, used for operation in the country, and a small headlight of the marker type in the bottom panel of the train door for city operation.

The exterior of the car is painted attractively with a pleasing combination of Flamingo red and light cream. The lower part of the body from the sill to the belt rail is red, and this color is carried entirely around the body and across the doors and vestibules, further enhancing the long, straight lines of the car. Piers, window posts, letterboard and upper half of the doors and vestibules are painted in light cream, and the roof, trolley boards, etc., are finished in golden brown. The running gear and trim beneath the car are black. The names on the side panels and the body striping are carried out in gold leaf, adding to the rich effect.

Fire Extinguisher Equipment Well Marked

PART of the car storage of the Beaver Valley Traction Company at New Brighton, Pa., is unheated and is not entirely fireproof. As shown in the illustration, fire buckets are hung on the wall, but to make their location readily seen a bright orange strip is



Fire Extinguisher Container Is Here Shown in Both Open and Closed Positions to Indicate Simplicity

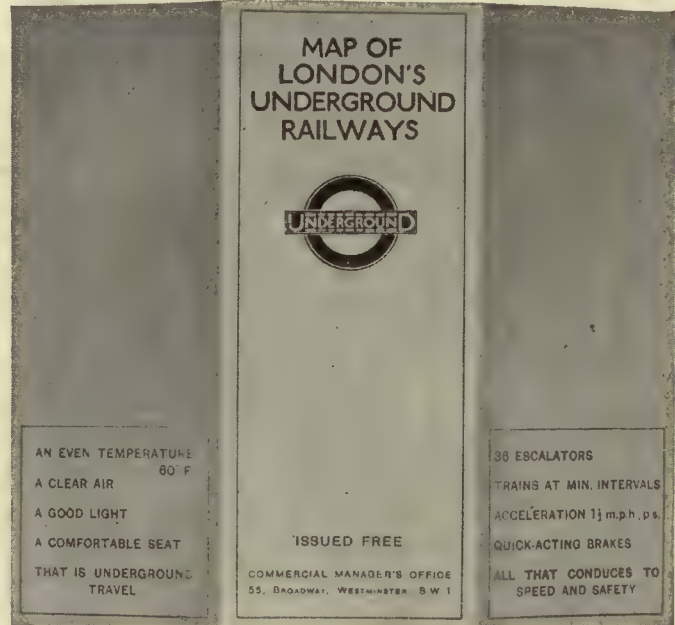
painted on the walls and run up to the roof so that, even though the tracks are filled with car equipment, a glance at the wall over the top of the car roofs will show quickly where the fire buckets and fire extinguishers are located.

To prevent freezing in the winter a lamp is kept burning in the bottom of the liquid fire extinguishers.

When the door is closed the light shows through a red bullseye. The illustration at the right has the door open to show the arrangement of the light with respect to the fire extinguisher and the simple method of installing the red bullseye.

London Underground Distributes Railway Map

DISTRIBUTION of a neat and attractive little folder map of the London Underground System was made to its patrons recently. This map is only 6 in. x 5 in. opened up and is but 5 in. x 2 in. when



London Underground System's Folder Map Also Carries Publicity and Is Small Enough to Be Slipped in One's Pocket

folded. It is mounted on vivid red linen and on the outside is printed information regarding the service, speed and safety of the underground system, as shown by the accompanying illustration. On the other side is a map showing all the lines on the system, each in a different color. The names of all stations are shown on the map in bold type which may be easily read.

Magnetic Brake Tested on Oiled Rails

PARTICULARS of some tests of the magnetic brake of the Buffalo & Erie Railway were published in the issue of this paper for July 17. On July 20 further tests of this brake were made on greasy rails. A section of straight track about 700 ft. in length was selected for the purpose, and the heads of both rails were coated with heavy car oil. A car with the magnetic brake was then run into this greased section at a speed of 45 m.p.h. and both magnetic and air brakes were applied. The car stopped in 470 ft.

A second test was made under just the same conditions except that only the air brakes were applied. The car in this case went through the 700 ft. of oiled track and was stopped on the dry track, 85 ft. beyond the oiled section.

The comparison was actually more favorable for the braking qualities of the magnetic brake than appears from the figures just published, because during the first test part of the oil on the rails had been removed by the action of the wheels and the rails had been sanded.

Maintenance Notes

Spray-Lacquered Signs in St. Louis Shops

QUICK drying has been found of particular advantage when painting signs used for car stops, loading zones, etc., by the United Railways in St. Louis, Mo. The metal disks, including the standards and bases, are sprayed with black Duco. The lettering is then applied by spraying white Duco through a template cut from thin aluminum. The quickness with which this lacquer dries avoids the difficulty of handling while wet and allows the signs to be placed in use as soon as completed. Whenever the signs become battered or otherwise begin to look badly they are brought in and reconditioned in a few hours time.

Old Axles Brought Back to Size by Welding

WHEN the wheel fits and journals of axles of the Dallas Railway, Dallas, Tex., become worn, due to several replacements of wheels, and long use of the axles, the axles are built up by gas welding new ma-

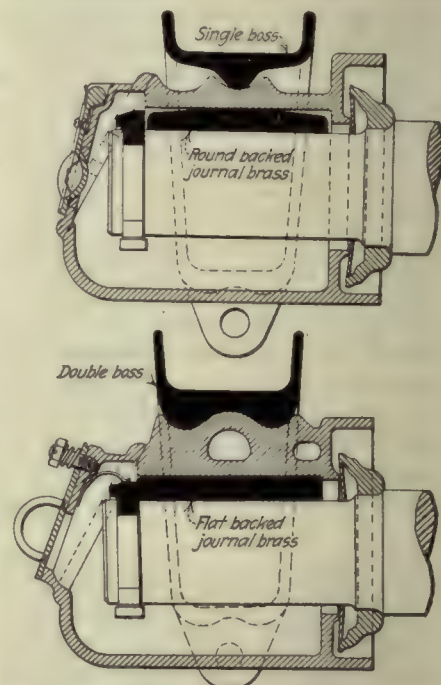
terial and re-turning the wheel fits to their original size. The accompanying illustration shows an operator installing this new material on one of the axles. The illustration also shows a convenient buggy used for moving armature shafts about the shop in places where cranes are not available. This buggy also holds the axle in a handy position for building up the ends.

Overcoming Nosing of Single-Truck Cars

CHANGES made in single-truck construction, in order to eliminate the rocking action which is common to short wheelbase single-truck cars, are described in a paper read before the meeting of the Managers' Section of the Municipal Tramways Association, at Edinburgh, Scotland, on May 27 by R. S. Pilcher, general manager Edinburgh Corporation Tramways & Motors.

The type of truck used by the Edinburgh Corporation (the municipal system) is the Peckham pendulum truck. This provides for a certain amount of movement between

the axle box and the truck frame. It was found that the movement became too free and that when oscillations had once started they were very liable to increase with the speed of the car. This truck is fitted with a single boss resting on the axle box which is used as a pendulum. The original construction is shown in the accompanying illustration. In the changed design a double boss was adopted with centers 3 in. apart. This had the effect of reducing the oscillating motion somewhat but did not eliminate it. The brass check



The Original Construction of the Peckham Pendulum Truck Is Shown at the Top. Below Is Shown the Journal Bearing and Boss Changes Which Remedied Truck Oscillation

plates were made a driving fit so that there was practically no play in the axle box. The most effective change, however, was to make the top of the journal box bearing flat instead of rounded. Manufacturers originally supplied the bearings rounded so as to provide for an easy movement, but it was found when this rounded portion was planed off and the bearing made quite flat that the motion was entirely stopped.

In addition to the changes as outlined, axle check-plates are kept tight and axle boxes are carefully inspected at regular overhauling periods.



Dallas Railway Builds Up Car Axles by Welding Process. Note the Handy Buggy Constructed Out of Pipes and Fittings

Maintaining Rapid Transit Cars



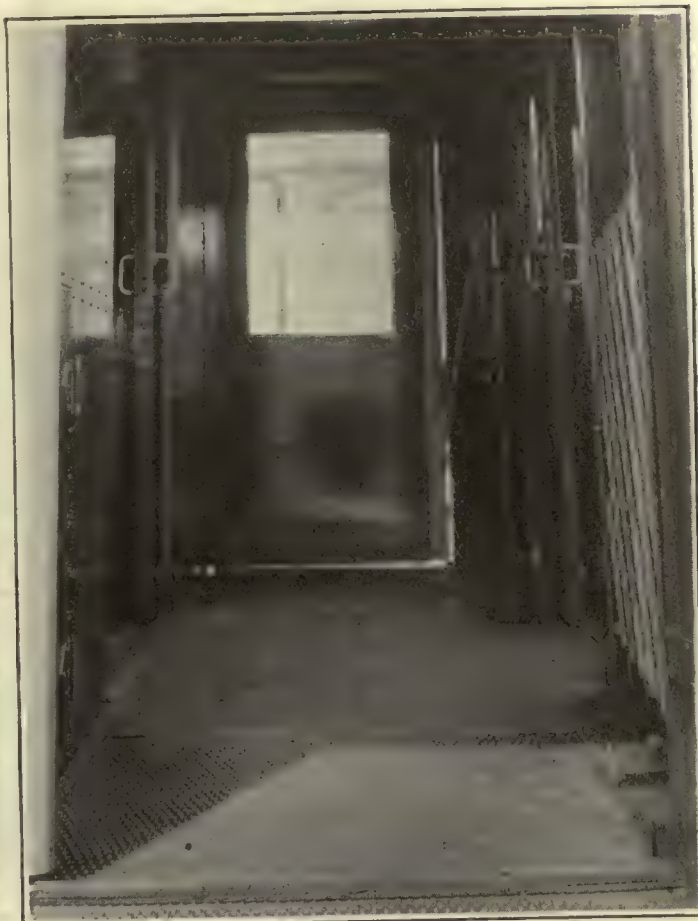
The Worn Aisle Is Filled in with Composition Flooring and Is Then Sprayed Red. New Type of Gas-Filled Lamps Are Installed

WHEN some of the cars of the New York, Westchester & Boston Railway which had been in service fifteen years required general repairs occasion was taken to make certain improvements and replace some of the equipment. The air-operated doors originally had a long-stroke type of door engine. This engine is now being replaced with the National Pneumatic Company's CS8 electric door engine, which is installed in the same location as the other one was; that is, back of the door pocket. This type of door en-

gine uses Westinghouse magnet valves, which are standard for the control equipment used on the cars. This reduces the number of spare valves which it is necessary to carry in stock.

Some of the steel doors of these cars were found to be rusted through. These are being replaced at the same time that the door engines are installed. The platforms were originally provided with rubber mats, which lasted on an average of about six months. Some trouble was also experienced from slipping when the mats were wet. In order to do away with the rubber mats the platforms are now being provided with Kass safety treads. The officials on the railway expect that these will last from eight to ten years.

These cars are provided with com-



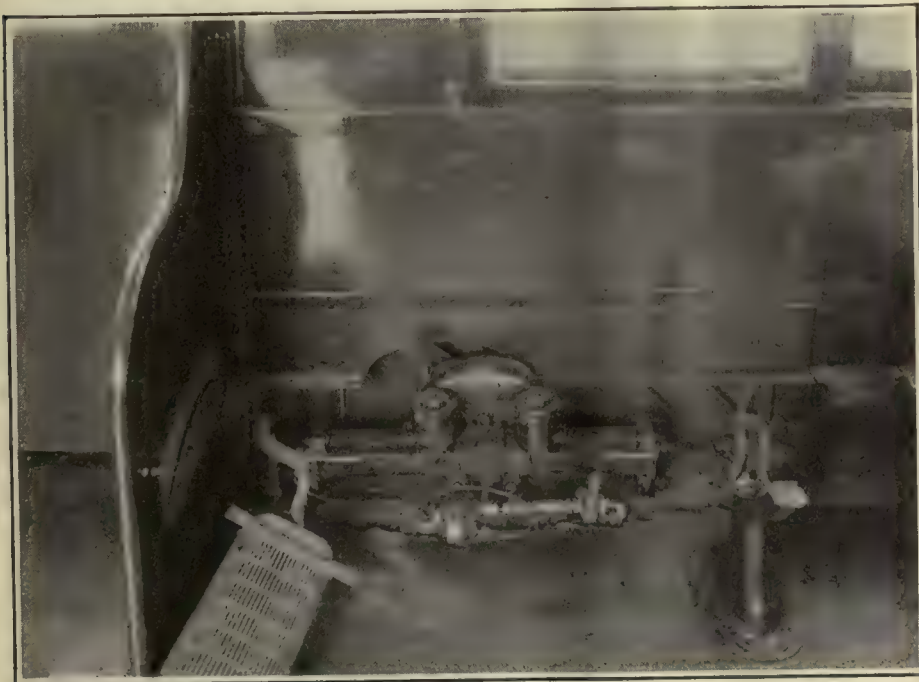
Safety Treads Do Away with the Necessity for Rubber Mats on Platforms. A New Steel Door Has Been Installed

position flooring and the aisles have become somewhat worn, so it is necessary to renew these. This is done by replacing with Flexolith. After installation the entire floor is sprayed with a red floor paint. Some trouble has been experienced in keeping curtains clean. Due to the pattern used, these presented an unattractive appearance. In order to provide more satisfactory looking curtains the old ones are now being dyed black.

Advantage has also been taken of this general overhauling to increase the lighting efficiency inside the cars. Originally the lights used were of 56-watt capacity and the S19 bulb was used. These are being replaced by a 60-watt type A21 gas-filled bulb.

Effective Illumination for Shop Benches

BRIGHT illumination on workmen's shop benches, but without annoyance from direct rays of the lamp, is provided by mounting fixtures with proper reflectors directly on the benches in the shops of the Department of Street Railways, Detroit, Mich. The support for the



A New Type of Door Engine Is Being Installed in the Door Pocket



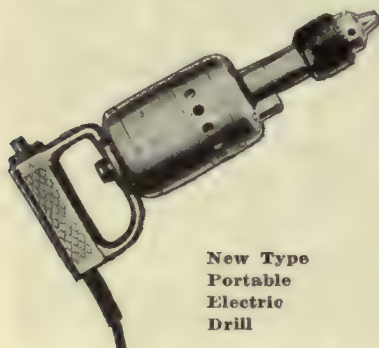
Efficient Bench Lighting as Provided in the Shops of the Department of Street Railways, Detroit

light and fixture consists of $\frac{3}{4}$ -in. conduit, which is bent with easy turns, so that the wiring can be carried inside without difficulty. A standard pipe flange serves for fastening to the bench. The fixture is a Benjamin dome, No. 100, which is 15 in. in diameter, white enameled on the inside and green on the outside. A single 56-watt lamp is used.

New Equipment Available

Light-Weight, Center-Drive Electric Drill

AN EXCEPTIONALLY powerful portable electric drill built for continuous production work is being marketed by the Industrial Tool Corporation, New York, N. Y. Outstanding features of this tool are light weight and a center drive con-



New Type Portable Electric Drill

struction. This latter feature gives even balancing and results in more accurate work than similar type tools. This portable electric drill is furnished complete with a Jacobs three-jaw geared chuck and key for drill bits ranging in diameter from the smallest size to $\frac{3}{8}$ in.

The tool is also supplied with 10 ft. of portable cord and an attachment plug. The cord leads into a convenient switch handle so that it is out of the way of the operator. The construction includes helical gears, an aluminum housing and handle, oil and grease lubrication, extra large thrust bearings and an air-cooled universal motor. The motor housing is especially designed to dissipate heat by a large fan which draws off any that might arise through continuous use of the drill. The power factor of the motor is con-

siderably in excess of that normally required with the largest drills.

The drill spindle is made up of special tool steel and the end-thrust is taken on a set of ball bearings. Reduction gears are cut from alloy tool steel carefully hardened and operate in a grease-type compartment.

Insulated Handle on Lamp Guard

IMPROVED construction of lamp guards made for use in electric railway shops, garages, etc., by the Crouse-Hinds Company, Syracuse, N. Y., provides a strong, light-weight unit. A handle added at the base is made of well-seasoned maple with Duco finish. This acts as an insulator between the wires and the work-



Improved Lamp Guard Showing Strain Relief Cord Clamp

man's hand. A cord clamp rests against a shoulder in the handle and takes any strain from the wire.

A lamp socket made of cold molded material is provided, which will not soften under the heat of the lamp. A few turns of a wing nut allow the hinged part of the guard to swing back, giving free access to the lamp. There are no detachable parts which might be lost when inserting or renewing a lamp, and when engaged all parts are securely locked together so that they cannot be disengaged accidentally.

The guards and half shades used in connection with these lamps are made of special cast aluminum alloy. This forms a rugged as well as a light-weight construction. The hook at the end of the guard is made of bronze and is arranged to swivel.

Association News & Discussions

The Auditor—Pilot of the Boat*

BY CHARLES E. THOMPSON
Vice-President Chicago, North Shore & Milwaukee Railroad

IN THE great organizations which must be built up to operate a railroad property successfully, the auditor might be termed the intelligence officer. Upon him the operating men must rely for the information which tells them whether they are operating the property successfully or otherwise. He is like a signal on the track. From his books and accounts he can give the necessary information as to whether there is a clear track ahead, or whether the red signal must be hung out to call a stop.

An auditor, to fill his position efficiently, must be absolutely impartial. He has before him constantly a picture of the financial operations of his company and he must take the facts and figures as they are and supply the information necessary to the management from those facts and figures. It is his business to keep expenses within the revenues, and this he must do regardless of whether that course is pleasing to other officers or not. If he neglects that most important of all duties it is not difficult to see that sooner or later the company will get into serious financial trouble.

The auditor probably is the most unpopular officer in an organization. He frequently has pressure brought to bear upon him to let this, that or the other expenditure get by. He cannot afford to do it, even though his refusal may be unpopular. He is the watchdog of a company's finances, and watchdogs are given to growling, even though they may not bite. That accounts for the unpopularity of the auditor with some other officers in an organization. It isn't the fault of the auditor; it's the job.

There is a good deal of misconception in a large organization about the duties of the auditor. Some imagine him as a bookkeeper who looks after the books and accounts of a company. But an auditor is not a bookkeeper, or rather I might say he is much more than a bookkeeper. If he is only a bookkeeper he is not likely to be an efficient auditor. The bookkeeper can put certain facts and figures in his books and they may be absolutely accurate and not mean much. The auditor must take those facts and figures, analyze and interpret them to the operating chiefs. He is the pilot of the boat and must be able to see ahead and guard against running on hidden rocks or shoals. If he is on to his job and does his duty fearlessly

and impartially he is quite likely to make some enemies.

You auditors and accountants have your fingers on the financial pulse of your companies, and sometimes I am inclined to think that you are apt to take too pessimistic a view of a situation. You are too apt at times to see only the cold figures, and because they do not look as rosy and as promising as you would like to see, you allow your vision to be contracted and obscured to future possibilities.

It is the business of the auditor to look ahead and anticipate, as well as to analyze a current situation. The electric railway industry in the last few years has proved itself to be one that has wonderful recuperative powers. It is true that within the last few years the industry has met some situations that looked rather gloomy to those who could see only the cold figures. To some it looked as if the sun never would shine again, but it did, in fact it never ceased to shine, although clouds may have obscured its light except to those who had strong vision.

I believe you men can see a brighter picture of our industry than you did at your last convention. I am quite sure you will be able to see a still brighter picture at your next gathering. Our industry as a whole is now facing the sharpest competition it ever has encountered. We should not feel discouraged over that situation. In fact,

as I look at it, it is a sign of encouragement. It is a sure indication that our competitors do not look upon our industry as a dying one. No one cares to bother about a business that is headed toward oblivion. It is when it is headed in the opposite direction, when its business is increasing by leaps and bounds, that its competitors grow alarmed and go after it.

The present fierce competition which many of our companies are facing is a healthy sign. It is putting us to the test. It is waking us up and putting us on our toes to get new business, and I am just as confident of the future of the electric railway industry as I am that the sun will rise tomorrow morning.

Welding and Cutting Exposition

THE fall meeting of the American Welding Society will be held in Buffalo on Nov. 17, 18 and 19. An international welding and cutting exposition will be held in connection with this meeting and will open Tuesday afternoon, Nov. 16.

The technical sessions include railroad welding apparatus, welding science in the engineering curriculum of universities, and welding in a gaseous atmosphere. The entertainment includes a trip to Niagara Falls, a view of the Falls from the American side, with an inspection trip through the Niagara Falls power house, a buffet supper on the Canadian side and a special illumination of the Falls. There will be the usual annual fall banquet, which is expected to be an outstanding success, and a meeting of the American Bureau of Welding, the board of directors and the welding wire specifications committee. Further details will be announced in an early issue of the JOURNAL.

How to Get to Pelham Bay Park

DIRECTIONS for reaching Pelham Bay Park, where the Metropolitan Section, A.E.R.A., will hold its second annual outing, Wednesday, Aug. 11, are given in a folder recently distributed to members. This park is at the northeasterly end of the Borough of the Bronx, New York City. It is reached by the Pelham Bay branch of the Interborough Rapid Transit subway system, which connects with the Lexington Avenue express service of the same company at 125th Street. The Pelham Bay branch connects also with the Westchester Avenue and Tremont Avenue lines of the Third Avenue Railway system.

To reach the park by automobile from New York City the route follows the Grand Concourse to Fordham Road and thence to Pelham Parkway, which leads directly to Pelham Bay Park.

COMING MEETINGS OF

Electric Railway and Allied Associations

Aug. 11—Metropolitan Section A.E.R.A., annual outing, Pelham Bay Park, New York.

Aug. 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

*Abstract of address before the Central Electric Railway Accountants Association, July 23-24, 1926, Drake Hotel, Chicago, Ill.

The News of the Industry

Eastern Massachusetts Arbitration Begun

Men Are Presenting Their Side of Case for an Increase in Pay—13-Cent Advance Asked

All the terms of employment between the Eastern Massachusetts Street Railway, Boston, Mass., and its blue uniform men who are affiliated with the Amalgamated Association have been submitted to arbitration. Public hearings were started during the week ended July 31 before a special board.

The arbitrators are Judge John C. Leggat of the Middlesex Probate Court, chairman, and James H. Vahey representing the men and Fred A. Cummings the company. Mr. Vahey and Mr. Cummings have served together on previous arbitration boards.

The men ask for an increase in the basic rate of wages from 61 cents to 74 cents an hour, maximum. Their present rate is 55½ cents an hour for the first three months, 58½ for the next nine months and 61 cents an hour thereafter; they ask for an increase to 70 cents, 72 cents and 74 cents respectively. In addition to this they want the differential in favor of the one-man car operators increased from the present rate of 5 cents to 10 cents. This would make the maximum rate 84 cents an hour for about 96 per cent of the men.

The company's counter proposition is that the present basic rate be reduced to 56 cents with the one-man car differential unchanged.

Further, the employees ask that their work-day be reduced from the present nine hours in eleven to a new schedule of eight hours in ten. They also want the overtime pay increase to time-and-a-half, it now being time-and-a-quarter. The company proposes a continuation of the present practices.

The men also want seniority rights restored. These were abolished in 1918 by the War Labor Board. The men also want ten minutes at the beginning of the day and twenty minutes at the close to prepare and put up the cars. This is opposed by the company.

The company also proposes a reduction in the allowance for meals from the present limit of 75 cents to a new limit of 60 cents.

James H. Vahey serves both as arbitrator and lawyer for the men. He addressed the board at the opening of the hearings on July 26 to the effect that the Eastern Massachusetts Street Railway is virtually an "open shop" road in that its employees are organized under the Amalgamated merely for the purpose of collective bargaining, and for sick and death benefits and pensions. He presented the men's contention that the company should pay such wages as a family of husband, wife and three children needs to be able to

live in health and reasonable comfort. In the pending case, however, he does not intend to offer evidence to support the proposition that such wages should be paid regardless of the financial condition of the company. This is an issue which has received much attention at former arbitration hearings. He cited the basic rates on some of the other roads, the Elevated paying 72½ with a 10-cent differential; Worcester and Springfield 68 cents with an 8-cent differential; New Bedford \$1.24 an hour.

The first witness for the men was Arthur Sturgis, who has figured as wage expert for street railway employees in most of the arbitration hearings with which Mr. Vahey has had official connection. He showed by tables that at least since 1912 the scale of wages has

been higher on the Boston Elevated than on the Eastern Massachusetts, and that the average difference for the whole period amounts to 6.79 cents. He presented another table which indicated that between Jan. 1 and June 1 of this year there have been 32 wage reductions and 420 wage increases throughout the country. In the twelve months ended June 1, 1926, there were 177 reductions and 847 wage increases. According to him the trend of wages has been steadily upward, and it has been even more marked during the first half of the present year. Another comparison made by Mr. Sturgis at the opening session contrasted the carmen's pay with that of the building trades mechanics, who, according to his statistics, receive \$1.46 to \$1.91 an hour.

Another Move in Kansas City Franchise Matter

Original Settlement Suggestion Has Been Withdrawn—Substitute Measure Appears in Interest of Successor Company to Kansas City Railways—Recent Moves Reviewed

ONE street railway franchise ordinance, extending the present grant for twelve years, passed out of existence in the City Council of Kansas City, Mo., on July 26. A similar extension to the Kansas City Public Service Company, with the added concession of a reduction in fares by selling fifteen tickets for \$1, appeared immediately.

The new ordinance is in the form of an amendment to the Jost franchise granted in June, 1914, to the Kansas City Railways. It was referred to the Council as a committee of the whole and public hearings will be held at once.

Councilman A. N. Gossett introduced the amendment. He said it was done with the full knowledge and consent of the new owners of the company and that, if passed, it would be acceptable.

Briefly the ordinance which was voted down provided:

A \$33,000,000 valuation.

A franchise to run 30 years.

The rate of fare based on service-at-cost, the maximum not to exceed 8 cents.

The elimination of the board of control and the five city members of the board of directors.

Beginning three years after the passage of the ordinance, the company to expend at least \$2,000,000 annually for improvements.

Extensions to system to be authorized by ordinance and accepted by the company to pave and maintain the paving between its tracks.

The company to pay an annual rental of \$16,800 for use of the Intercity Viaduct.

The new ordinance, introduced by Councilman Gossett, briefly provides:

A material reduction in fares for those who care to avail of it (fifteen tickets for \$1, which is at the rate of 6½ cents a fare), with a provision not in the present franchise that the methods and places of sale of such tickets shall be made convenient

to the public as the Council by ordinance may require.

That the owners shall operate one system, including general transfers for the legally two Kansas Cities—commercially one greater city.

That the company shall pave, and repair and maintain the paving, between and 18 in. outside of the tracks; this to be done speedily and as the Council may by ordinance require.

The city retains all the right it now has to apply for further reduction in rates and remedies to compel observance of other obligations and conditions of the franchise.

No fixed valuation.

The first franchise ordinance was opposed from the beginning. The new proposal will also be opposed by several members of the Council. Mayor Beach contends that he will favor no franchise ordinance until a low valuation has been set. The Mayor said:

Personally I do not think much of a new franchise at this time. I think the new company should take over the property and operate it for a time before asking anything of the city.

C. J. Bell, another Councilman, said:

I think something should be put in the ordinance that will absolutely fix the valuation, which, in my opinion, now is an exorbitant one.

Ira B. Burns, and at least one other member of the Council, concurred in this.

TERMS OF NEW ORDINANCE EXPLAINED

In presenting the new ordinance Mr. Gossett spoke of the necessity of a railway system and said an extension of time would enable the company to operate more economically and thereby would prove a benefit to the city in the possible reduction of fares in the future. He said the amendment provided no valuation, but bound the company to an agreement to operate under the new rates of fare, which he believed was

more binding than a fixed valuation which the State Public Service Commission could change.

Judge Henry L. McCune, another Councilman, explained after the meeting that, under the new city charter, a franchise ordinance can be passed by a majority vote instead of two-thirds, as formerly required. Within ten days, however, a notice signed by 100 registered voters, giving notice that a petition is to be circulated calling for a referendum vote, will hold the ordinance up for 40 days. In the meantime, if a petition signed by 10 per cent of the persons voting for Mayor at the last city election is filed with the Council, the measure must be submitted to the people for a vote.

William G. Woolfolk, president of the Kansas City Public Service Corporation, the successor to the Kansas City Railways, has declared a new franchise or an extension is necessary if the new company is to be soundly re-financed. Mr. Woolfolk said:

If we cannot get a longer term franchise we will be handicapped in financing the company. It is easier to get money on a long-term than on a short-term. The terms of financing, of course, will affect the operation of the company, and we are deeply interested in getting the company organized on a sound basis.

Strike Leaders at Indianapolis Guilty of Contempt

Jefferson Fade, former employee of the Indianapolis Street Railway, Indianapolis, Ind., was found guilty on July 29 of contempt of federal court. He is the eleventh person found guilty since operatives of the United States Department of Justice started their investigations in connection with union activities on the railway lines. The day previous John M. Parker and Robert B. Armstrong, vice-presidents of the Amalgamated Association and the organizers of that body in Indianapolis, were found guilty by the court after a trial which lasted virtually the entire day. Edgar Day, who was allowed a jury trial, also was found guilty. Judge Robert C. Baltzell was expected to sentence the entire eleven on the morning of July 30. In his few remarks during the trial of the two organizers he appeared particularly bitter in his statements concerning the general attitude of Parker. Parker is alleged to have made a speech at an organization meeting when the strike vote was called, after the issuance of the federal injunction, during which it is reported he said he had a whole bushel basket full of injunctions at home and had read more injunctions probably than Judge Baltzell himself, but none of them was worrying him. It is understood the attorneys will appeal the finding of the court. The entire eleven were in jail on July 30 awaiting sentence.

Judge Baltzell made it plain that he would stand for no violence on the part of strikers or sympathizers and would deal summarily with any violations of the injunction. He reiterated that the men had a right to organize and strike if they desired, but he would not stand for any vandalism. Only one case of serious disorder was reported this week to the police.



Strikers Follow Their Leaders to Interborough Headquarters

Strike on New York Subway "Declared Off"

Technically the strike of the motor-men and switchmen on the subway division of the Interborough Rapid Transit Company, New York, did not end until Thursday night. Once before the strike had been declared off by the men, but when on July 23 the workers marched to the Interborough yards at Lenox Avenue and 147th Street and asked to be taken back in a body, the company remained firm in its determination to treat with the men only as individuals. Consequently, nothing was left to the strikers but to march away again.

That evening, after a mass meeting, a clash occurred between the men and a squad of special Headquarters detectives, in which several of the strikers were injured, one very seriously. The strikers claim that the police made a brutal and entirely unprovoked assault, and they have made many appeals for retribution, the latest being contained in a letter to Governor Smith, in which the Chief Executive of the state is asked to investigate the New York Police Department and punish the men responsible for Friday's "outrage." At the present writing these appeals have brought no results.

On July 27 Edward P. Lavin, leader

of the strikers, issued a "call" to all employees of all transit companies for a general strike, to start Saturday, July 31. The fact that this summons met with very little response was the final blow to the strikers, for on Friday, July 30, it was officially announced that the strike was over. The company has agreed to take back all the men except the three leaders, concerning whom a special conference will be held.

Service on the Interborough was practically back to normal long before the men condescended to take public cognizance of the fact by formally declaring the strike at an end.

First I.C.C. Bus Hearing Held

The bus was hailed as an increasingly necessary supplement to the electric and steam railways, on the one hand, and condemned as an unregulated nuisance on the other, when the rail carriers, both electric and steam, had the first inning on July 27 at the opening in Chicago of the Interstate Commerce Commission's series of hearings to obtain data from which it may decide what position to take regarding the regulation of buses.

In his opening statement Commissioner John J. Esch, who presided, said that the purpose of this hearing



Men Wait in Vain to Be Taken Back en Masse

was "to lay before Congress the possible advisability of wise and appropriate legislation in regard to motor vehicles, and especially a uniform legislation like that governing the rail carriers, with the added necessity of avoiding some mistakes made in that direction through our experience there."

Among the first witnesses from the electric railway field were Charles L. Henry, receiver of the Indianapolis & Cincinnati Traction Company and a committee member of the American Electric Railway Association; G. K. Jeffries, general superintendent of the Terre Haute, Indianapolis & Eastern Traction Company, and J. W. Welsh, secretary of the A.E.R.A. Charles Chase, president of the Gary Railways and also of the Shore Line Motor Coach Company, said he believed there is a genuine demand for transportation by bus and that the railways should have the first chance to provide it. The chief offenders in cutting railroad revenue were the privately owned automobiles and not buses, according to P. S. Eustis, passenger traffic manager of the Chicago, Burlington & Quincy Railroad.

The rail men were given the first day of the three days which the Chicago hearing was scheduled to cover. The plans called for presentation of testimony by the motor transportation industry on the second and by the public on the third. The same schedule will be followed in each of the twelve other regional hearings. The matter will be concluded with a national hearing in Washington starting on Sept. 29.

One-Man Car Now in Public Favor in Milwaukee

After experiencing vigorous opposition on the part of the public to any plans to introduce one-man cars on its lines, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., seems to have won over the public to the merits of the one-man car as an essential part of its transportation system.

This transition was strikingly exemplified at the hearing recently before the Railroad Commission to consider the proposal of the company for the partial operation of one-man cars on the Wells-Downer line, which runs through the east side "Gold Coast" district as well as the better class residential district on the west side. The hearing, called to give any objectors an opportunity to present their views, was marked by the absence of objection or complaint against the proposed plan. In consequence it is expected the commission will issue an order in favor of the company, which plans to place these cars in service on Oct. 1.

Under the new arrangement, which will make it possible for the company to increase the standard of service without additional cost, twenty one-man cars are to be added in place of some of the two-man cars now in use. Two-man cars taken off are to be rebuilt and converted into one-man cars.

The success of the company's one-man car policy is attributed largely to the constructive manner in which the

company endeavored gradually to overcome and win the public over to its side. An intensive newspaper advertising campaign consisting of good-will advertisements bearing the personal signature of S. B. Way, president, introduction and use of more modern and attractive one-man cars, short educational talks on the one-man car by trained conductors who boarded one-man cars at crowded points, were among the ideas which the company developed in removing the antipathy of the public toward the one-man cars.

Men on Public Service Answered

On July 28 the employees of the Public Service Railway, Newark, N. J., were informed that not only will the companies be unable to comply with the demand for increased wages but that financial conditions require that the men accept a wage reduction. This answer was given by M. R. Boylan, who said he had studied with particular care and attention the draft of a wage agreement setting forth terms and conditions of employment, offered for the acceptance of Public Service Railway, Public Service Railroad and Public Service Transportation Company. Mr. Boylan said in part:

The agreement provides for trainmen a flat increase in wages of 15 cents an hour; for other employees standardization of rates and an increase of 25 per cent, and, for all, changes in working conditions which would, if made effective, add further to the pay-rolls of the companies.

A conservative estimate of the aggregate cost of putting in effect the changes stipulated, on the basis of present operations, is more than \$3,000,000 a year.

Consideration of the affairs of the companies, their revenues, operating expenses and prospects of additional revenue make it clear that no part of the additional charge involved can be assumed.

As explained in a communication addressed to the members of your association on June 1, 1926, the increase in wages provided by the agreement which went into effect Oct. 1, 1923, resulted for the thirty-month period ending April 1, 1926, in the failure of Public Service Railway and Public Service Railroad to earn operating expenses and fixed charges by a total amount of \$1,797,744, and in the failure of Public Service Transportation Company to earn operating expenses by \$1,736,473. The total deficit, exclusive of the fixed charges of the transportation company, therefore, amounted for the period to \$3,534,217.

It is important to consider that this large deficit accrued in the face of all possible economies, and in spite of the fact that the combined system is being operated more efficiently than ever before in its history.

Economical and efficient operation has improved the financial condition of the companies, yet for the twelve months ending June 30, 1926, railway and railroad companies failed to earn operating expenses and fixed charges by \$146,349, and transportation companies by \$179,564.

In the face of these conditions, to increase the expenses by the more than \$3,000,000 required to meet the terms of the wage agreement submitted by your board, or by any other sum of money, would be to incur an obligation which the companies have no ways of meeting and would result in disaster ruinous to all interested—public, employees and company.

The wage increase of Oct. 1, 1923, was granted in the belief that the additional expenses involved could be absorbed through economies in operation. Experience has proved, however, that such savings were insufficient for this purpose, that there is no possibility of effecting further economies in any substantial amount, and that a return to the wages in effect before Oct. 1, 1923, is necessary.

Careful consideration of all conditions affecting wages has been given by Public Service companies. The results were embodied in my communication of June 1. For the reasons therein cited, we are compelled to stand upon the conclusions as to the terms of the new agreement contained in

that communication, and I am accordingly returning to your board the form submitted to me July 22, 1926.

William Wepner, chairman of the joint conference board of the Amalgamated Association at Newark, N. J., had previously informed Mr. Boylan that the wage proposal made by the company had been submitted to the nine locals, composed of employees of the companies affected, and that as a result of their deliberations a form of agreement had been drawn up which embodied the ideas of the board and the members of the association as to the rate of pay and working conditions which should be adopted.

This proposal by the men called for an increase over present rates of pay and certain changes in working conditions which are considered to be in the interest of the men. Mr. Wepner said the men are "in no position to dispute the statement as to company finances, but they believe that the wages and conditions they ask for are reasonable and should be accepted."

Jitneys in Detroit Die Hard

After winning a fourth respite the jitneys were still operating in the streets of Detroit, Mich., on July 21 while their battle was being fought in the Circuit Court. The hearing on a motion by the city for the dissolution of the injunction granted the jitney drivers a week previous was postponed to July 21, but Judge Dingeman warned that no further postponement would be granted.

As a result of a writ of error, ordering the jitney case to the United States Supreme Court, jitneys are permitted to continue using Detroit streets. Representatives of the drivers' associations say city officials have adopted a policy of harassing jitney drivers by giving them tickets for every conceivable kind of traffic violation.

Word was received in Detroit on July 26 that Chief Justice Bird of the Michigan Supreme Court had signed a restraining order placing the status of the jitneys back on the plane established by the injunction issued by Judge Hunt in December, 1923, forbidding the city to eject the jitneys.

The attorney for the jitney men obtained the U. S. Supreme Court ruling on the basis that the state court's writ violated constitutional rights contained in the Fifth and Fourteenth Constitutional Amendments, one relating to the rights of property and the other concerning class legislation. It was Attorney Barnard's contention that ejection of the jitneys under the present ordinance constituted class legislation inasmuch as buses are permitted to operate.

The latest order of the Michigan Supreme Court restrains any further interference with the operation of the jitneys pending final determination of the federal court appeal. The order also makes void all actions now in court, including the decision which was to have been rendered by Circuit Judge Dingeman.

The moves are coming thick and fast and the status of the case has changed rapidly, but the city is apparently determined that the jitneys must go.

Newspaper Co-operation in Cincinnati

**"Enquirer" Says that with the Public's
Co-operation Local Service Can
Be Greatly Improved**

Cincinnati's street car service can be made the equal of that of any other city in the country. This is the proud proclamation of the Cincinnati *Enquirer*, but that paper sees that result attainable only through co-operation between the railway company and the people.

In this respect the *Enquirer* indorsed heartily remarks made recently by Hudson Biery, director of public relations of the Cincinnati Street Railway, in an address before the Co-operation Club. Under the heading "The Sovereign Rider," Mr. Biery was quoted to this effect:

The car rider of Cincinnati controls the street railway. He has the right to see that the service is efficiently managed, to see that it is self-sustaining and that a reasonable rate of fare is maintained. Everything in connection with the street railway, he said, is controlled by the city; that it is really the car riders' railway.

Destructive competition, which reduces street railway earnings and increases the rate of fare, is your problem.

And then, in a remarkable example of what a newspaper can do toward extending co-operation in connection with a transportation problem, the *Enquirer* said:

This is true. The public can demand, exact, control, compel. Most important, it can co-operate with the street car company. The street car company desires this co-operation. An intelligent understanding of the entire situation with reference to the management and conduct of street car service, by the citizens, will go far toward insuring satisfactory service and satisfactory and equitable fare rates.

The management, stockholders and employees of the company are as surely public servants as are officials elected to conduct the affairs of the city, state and nation. They work for wages. They are the representatives of the people. The city government is their high superior, and the citizen car rider is sovereign over all.

Cincinnati's street car service, through co-operation between the car company and the people, can be made the equal of any in the country.

So much for the indorsement of the newspaper. Mr. Biery said many things other than those that have been quoted that are of interest. Here are some of them:

The street railway return on investment has been limited by the city, the capitalization has been definitely fixed by the city, the rate of fare automatically goes up or down with the cost of the service, and our whole operation is controlled by the city. It is really the car riders' railway. Even if you do not ride the cars you have a direct interest in adequate transportation and the elimination of traffic congestion.

Destructive competition, which reduces street railway earnings and increases the rate of fare, is your problem. It is up to you to see that the street car rider gets a square deal wherever and whenever the interests of his transportation system are involved. We are not asking for help or sympathy; we are only asking the citizens for an intelligent understanding of the whole situation, and in bringing about this understanding organizations like yours can be of great help.

The new department of public relations, which I have the honor to direct, is the car rider's department within the company, and tries to view his problem from his standpoint. We are trying to acquaint him with his rights and help him get the service he wants. Part of our job is to "sell" to the people of Cincinnati their own transportation system and the new franchise. The new franchise is simply a working contract protecting the interests of the street car riders against the rest of the city at large. The management, the employees and the stockholders under the service-at-

cost plan are the workmen for providing the service. They are allowed wages just as the policeman and the fireman, and in both cases your representative, the city government, is boss.

We expect to use many methods in bringing these facts home to the public. We are not trying to "press agent" the street railway, but when the newspapers want the facts we see that they get them. All of the papers are very fair about this. We are not going to talk a lot about improvements in the service until the improvements are made, but we are going to talk about the new franchise as the foundation for what can be done. When the people realize what they have in this new franchise we won't have to advertise the street railway. The car riders will do it themselves.

Wage Arbitration at Memphis Concluded

Final arguments in the wage arbitration between the Memphis Street Railway, Memphis, Tenn., and the carmen's union were submitted before the board of arbitrators on Saturday morning, July 24. While the time of the probable receipt of the decision cannot be forecast, reasonable haste is expected, inasmuch as the scale determined upon will be effective as of April 1, 1926.

E. W. Ford, vice-president of the railway, represented the company in stating its case. Judge D. B. Puryear argued the claims of the carmen.

On March 31, 1926, the contract between the company and trainmen expired. Negotiations between the two developed a new contract effective April 1, on which all points were agreed except a new wage scale. This point was submitted to arbitration with the understanding that the award made should become effective on April 1, along with other terms of the contract.

The wage scale under the former contract, in force for about two years, provided pay of 45 cents, 50 cents and 55 cents an hour for men employed one year, two years and three years or more, respectively. Approximately 74 per cent of the men, company records show, receive the maximum of the scale.

In the new contract the union asked for a scale increasing the former one about 12½ cents an hour. The company opposed the increase.

The members of the board of arbitrators are ex-Gov. M. R. Patterson, judge of the Circuit Court; Lovick P. Miles, attorney, representing the company, and A. B. Galloway, attorney, representing the union.

Charges of Mayor of Buffalo Answered

Following the hearing by the New York State Public Service Commission on the complaint of Mayor Frank X. Schwab, Buffalo, against the use of one-man cars by the International Railway, alleged inadequate service and the failure of the company to comply with the order of the commission to make repairs to its tracks, Bernard J. Yungbluth, president of the International, asked the state board to investigate the company's needs for more revenue to make improvements.

Mr. Yungbluth's statement says that the city's case alleging inadequate service and dangerous trolley operation "has collapsed so utterly as not to warrant a reply," and adds that the company is compelled to request an increase in fares because of the city's

insistence that it spent more money for track repairs and other improvements to its system in Buffalo. The company asks the commission to close its case upon the evidence offered by the city and says that taking of additional testimony would be merely a waste of time.

Frank C. Perkins, commissioner of public affairs, has asked for an investigation into the expenses of the International Railway from 1919 to 1925. He says the claim set up by Mitten Management, Inc., which operates the local traction system and the company's interurban lines and buses, that it is without funds to proceed with necessary improvements ordered by the commission and is in need of a higher fare, is not based on fact.

Bondholders' Committee Pretends to See Receivership Ahead

Foreclosure and a receivership impend for the Chicago Surface Lines. This was the forecast made in a letter sent out on July 22 to the holders of first mortgage bonds of the Chicago Railways by the protective committee.

The letter indicates that the committee is convinced that a receivership is inevitable upon expiration of the franchises next February. The 10,000 bondholders are urged to unite in depositing their securities with the committee in order to hasten foreclosure proceedings and reorganization plans at that time. The committee intimated that it held scant hope for a successful agreement being reached with the city for a new franchise before the expiration of the present term.

A somewhat more encouraging development in the solution of the city's transportation problems was indicated on July 23, when definite promise of the co-operation of surface and elevated lines officials was obtained by Mayor William E. Dever in a secret conference with Samuel Insull, chairman of the Rapid Transit Board; Henry A. Blair, president of the Chicago Surface Lines; Britton I. Budd, president of the Rapid Transit Company, and various bankers representing Surface Lines security holders.

Just what took place at the meeting could not be ascertained, but every one involved appeared to be satisfied with the results. The chief point of difference between the several factions at the present time is over the question of enabling legislation. The company officials have previously expressed the belief that it is futile for the City Council to continue with the work of framing a new traction ordinance until some sort of enabling legislation is obtained from the Legislature, especially pertaining to the "home rule" and unified operation features of the draft. The city opposes this program, but agrees with the companies that a franchise period longer than twenty years is desirable.

The railway officials and bankers are expected to confer among themselves within the next few days to find a suitable method for working with the city. They will then be asked to sit with the local transportation committee of the City Council in negotiating a new franchise.

Rochester Lines' Gain Continues with 8-Cent Fare

Continued gain in revenues of the New York State Railways, Rochester Lines, under an 8-cent fare is shown in the report of Railways Commissioner Charles R. Barnes to the Common Council for the quarter ended April 30.

The fare determining balance account deficit dropped from \$311,655 to \$249,305, but is still more than \$400,000 from the point where a lower fare would be possible under the service-at-cost contract.

Fares in Rochester were increased 1 cent on Jan. 1. The report just made is the only one showing operations for a complete quarter under the increased fare as the previous report gave figures only for January under the new rate.

The report for the quarter ended April 30 showed a surplus of \$71,511 from trolley operations and a deficit of \$9,151 from bus and trackless trolley operations, making a net surplus of \$62,359. Total number of passengers carried was 23,654,426.

Where Commissioner Barnes' report showed a deficit from bus operation, James F. Hamilton, president of the company, declared that the report charged transfer passengers as total loss as far as the buses were concerned, and if a credit were made the buses and trackless trolleys would show a surplus.

Date Advanced for Electrification in New York City

Extensions of time under the law passed in 1921 requiring electrification of railroads in New York City have been granted by the Public Service Commission to the New York Central Railroad, Long Island Railroad and the Bush Terminal Company. The petition of the New York Dock Company, which operates the Fulton, Baltic and Atlantic terminals in Brooklyn, was denied. In denying its application Chairman Prendergast commented as follows:

"There has been no effort to comply with the requirements of the statutes nor is there any promise that if an extension of time should be granted there would be a future attempt at compliance, all of which indicate the finding that sufficient reasons do not exist for the extension under the present circumstances."

The extensions granted the New York Central apply independently to the various divisions, some running to 1927 and others to July 1, 1930. These extensions were given without prejudice to further extensions on application filed on or before the dates set by the present action.

In the case of the Long Island Railroad, extensions were made until Jan. 1, 1931, to complete electrification. The company submitted evidence to show that it has a definite \$3,000,000 program for the current year and like programs for subsequent years, the total cost for electrification being estimated at \$13,000,000.

The Bush Terminal Company, operating piers and terminals on the Brooklyn waterfront between Second Avenue and 31st Street, the Pier Head line and 39th Street, and tracks on 41st Street

and First Avenue, principally on private property, also received an extension until Jan. 1, 1931. This company plans to install certain temporary overhead power construction to test the feasibility of handling cars from floats by means of electric locomotives.

First I. C. Electric Train Run July 21

As a sequel to many years of agitation and preparation, the first electric train in the Illinois Central Railroad's suburban passenger service started from the Randolph Street terminal in Chicago at 10:25 a.m. on July 21, 70 years to the day from the date commuters service was started on this line.

The pioneer electric train consisted of four cars, two motor cars and two trailers, and was filled with regular passengers and a large delegation of railroad officials and newspaper men.

For the time being only three electric trains a day will be operated in each direction between Randolph Street and Sixty-seventh Street. This schedule will gradually be extended, however, until it embraces all the regular suburban routes. Before Sept. 1 it is probable that the last steam locomotive will have been withdrawn from commuters' service, according to J. J. Pelley, vice-president in charge of operations. The old steam schedules will be adhered to until that time.

All of the 260 new cars have been delivered and tested.

On Aug. 7, the date complete electric operation will be started on the South Chicago branch, 116 south side civic and business organizations will join in a mammoth celebration. A tableau depicting the progress of transportation will be held in Grant Park stadium. Covered wagons, high bicycles, hansom cabs, surreys, stanhopes and even the Indian "travois" will be included in the display.

Both Factions Submit Chicago Wage Dispute to Arbitration

Elevated trainmen, taking the initiative in opening negotiations for the higher wages which have been asked by both surface lines and elevated employees in Chicago, agreed at a conference with Rapid Transit officials on July 23 to draw up an arbitration policy, but indicated that they are willing to arbitrate only the request for a wage increase of 5 cents an hour and insurance provisions. The company contended that its counter-proposal of a reduction of 5 cents an hour in wages and changes in working rules should receive equal consideration in the hearings.

At the close, on July 22, of the second conference within the last two weeks between operatives and executives of the Chicago Surface Lines, it was announced that no conclusion had been reached. Demands similar to those made by the elevated men have been presented by the Surface Lines' employees. The company has answered with a proposal for a reduction of 5 cents an hour. The date for a third meeting has not yet been fixed.

Two Cincinnati Arbitrators Chosen

Appointment of arbitrators to fix the wages of employees of the Cincinnati Street Railway, Cincinnati, Ohio, for the next two years has been announced. Attorney James H. Vahey, Boston, is the choice of the employees, through their organization, the Amalgamated Association. The arbitrator to represent the company is Walter A. Knight, Cincinnati attorney. These two will select a third arbitrator. The employees are still working under the terms of the two-year agreement which expired on June 30. The maximum wages under that agreement were 58 cents an hour for conductors and motormen of two-men cars, 60 cents for one-man car operators and 57 cents for bus drivers. The men asked for an increase of 12 cents an hour and the railway offered an increase of 1 cent an hour every six months for two years. No agreement was reached and the matter went to arbitration.

Fort Dodge Equipment Dismantled

Local railway service in Fort Dodge, Iowa, is a thing of the past. C. G. Crooks, president of the Fort Dodge, Des Moines & Southern, announced that dismantling of the city's idle railway equipment would be started at once.

As previously stated in the *ELECTRIC RAILWAY JOURNAL*, the street car service was discontinued Nov. 14, 1925, due to failure to meet operating expenses. Tracks and overhead were left intact, however, and since then have been standing idle. Buses will take the place of the cars.

The local railway has been in operation under the direction of the Fort Dodge, Des Moines & Southern road for the past twenty years. For ten years prior to that it was operated by local residents.

The system was started in 1896 by local capital and flourished for many years despite the fact that there was only one car in operation, running over a stretch of twelve blocks.

Baltimore Considers Rerouting Cars

The Maryland Public Service Commission has set Aug. 3 as the date for holding the first of a series of public hearings to consider the rerouting of street cars of the United Railways & Electric Company, Baltimore. The changes in routes were recommended by the Baltimore Traffic Survey Commission. The survey body divided the lines which it recommended changed into six groups, the first of which will be considered at the opening hearing. The lines involved in this group are Gilmore Street-Guilford Avenue, Linden Avenue, York and Frederick Roads, Towson and Catonsville, Wilkins Avenue, Back and Middle Rivers, Sparrows Point and Bay Shore and Federal Street-Washington Boulevard. Individuals and organizations interested in the proposed changes will be permitted to express their views at the hearings, which will be announced by notices in all the cars.

Fare Hearings in New York State Postponed

To allow the city authorities further time for checking up the New York State Railways' statements, Public Service Commissioner Lunn on July 23 adjourned from July 27 to Aug. 3 at Albany the pending hearing on the petition of the railway for increased fares in the city of Rome.

The hearing on the application for an increase of fares of the United Traction Company, Albany, in the Capitol district cities has been adjourned from July 27 to Aug. 10.

News Notes

Fare Hearing Deferred.—The hearing on the application of the Fresno Traction Company, Fresno, Cal., for an increase in its fares was postponed by the California Railroad Commission from June 1 to Sept. 28. The company previously had alleged that it had an operating loss of \$4,056 during 1925 as the result of its first year's operation under its resettlement franchise.

Rate Increase Suspended.—The 15 per cent increase in passenger commutation rates proposed in a petition filed with the Illinois Commerce Commission on June 15 by the Chicago, Aurora & Elgin Railroad, Aurora, Ill., and referred to in *ELECTRIC RAILWAY JOURNAL* for June 26, has been suspended until Nov. 12. In the meantime arguments will be heard by the commission for the new tariff, which, if allowed, would approximate that now in force on several steam lines that serve the same suburban territory.

Fare Suit Up on Appeal.—The suit of Daniel J. Furey to compel the Philadelphia Rapid Transit Company, Philadelphia, Pa., to pay the city \$57,900,000, alleged to have been collected in excess fares since the abandonment of the 5-cent fare some years ago has reached the Supreme Court. The petitioner claims the company has an obligation to charge only a 5-cent fare under its contract with the city entered into in 1907. The suit is a taxpayer's action. The case was dismissed by the United States District Court recently.

Conference on New Franchise in Wheeling.—After approving the report of the franchise committee the City Council of Wheeling, W. Va., recently authorized the members of the committee to confer with officials of the Wheeling Traction Company in an effort to have one general franchise drawn up. The franchise will relieve the company of all street paving obligations other than the maintenance of the base.

Parking Prohibited on Main Thoroughfare.—The St. Louis Board of Aldermen passed a bill on June 25 forbidding all parking of automobiles and other vehicles on Grand Boulevard, the chief north and south thoroughfare between Laclede Avenue and Page Boulevard. The measure now goes to Mayor Miller for his signature. The elimination of parking on this

street will greatly relieve traffic congestion and result in a speeding up of the Grand Boulevard street cars.

Higher Fares Asked in Michigan.—Through the proposal of W. J. Hodgkins, vice-president and general manager, the Lake Superior District Power Company has presented to the City Commission of Ironwood, Mich., a plan whereby the city is to join the company in petitioning the Michigan Public Utilities Commission for higher fares and relief from paving costs. In his communication to the city, Mr. Hodgkins warns that railway service will no longer be furnished in Ironwood if the city should refuse this request. The company recently submitted a proposal to the people of Ironwood to increase its fares from 5 to 8 cents and at the general election on June 24 the proposal failed by nearly 300 votes to receive the necessary two-thirds approval required under the city charter.

City Service Needs One-Man Cars.—The practice which the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been following in accepting passengers for transportation between points within Watertown on its interurban cars has been discontinued and one-man car service, operating on a half-hour schedule, has been installed instead to meet the demand for city service. A 5-cent fare is charged. The cars used on the new rapid transit line between Milwaukee and Watertown are so arranged that it is impossible to operate them from either end. Consequently they are unsatisfactory for city service.

Railway Co-operates in Freight Movement.—The Springfield Street Railway, Springfield, Mass., is co-operating with the Freight Container Service Company, a newly formed subsidiary of the D. S. Woodberry Company, in a plan by which the Freight Container service is employed for the moving of freight to and from the trolley terminals, the same service being given at the Boston end, making a door-to-door service. Another departure from the trolley freight system hitherto in vogue is that the system involves the use of flat cars, each equipped with rails for five steel-and-wood containers, built for quick loading and unloading at terminals. Rates are so fixed as to compete with the motor trucks.

South Shore Line Extends New Service.—The completion of the second step in the rehabilitation program of the Chicago, South Shore & South Bend Railroad was accomplished on July 20, when the railroad's new steel motor passenger cars were placed in service between Michigan City and Gary. The next step will be the operation of the new cars from Kensington to South Bend within a week or ten days and the final step, the operation through to Randolph Street, Chicago, will be carried out early in August.

Baltimore Company Buys Private Line.—Negotiations are under way by which the United Railways & Electric Company, Baltimore, Md., will acquire a privately owned electric line which operates to Franklinton, Hillsdale, Windsor Heights and several other small communities. The line is owned by the Lorraine Cemetery Railway and

is slightly more than 1 mile in length. It crosses the boundary of the city, but only a small part of it is outside the city limits. In the past the line has been operated by the United under a lease. Because it was a privately owned line and went out of the city it was necessary to charge an additional fare, making a double fare for the patrons to reach the downtown section of Baltimore. As soon as it is taken over, however, a one-fare system will be put into effect.

Insurance for Five Hundred Men.—The Chicago, Aurora & Elgin Railroad has entered into an agreement with its employees whereby each has an opportunity of taking out life insurance, together with dismemberment indemnity, on the group insurance plan. The contract has been placed with the Sun Life Insurance Company of Canada through its Chicago, Ill., offices. The policy total of \$500,000 covers approximately 500 employees of the railroad.

Half Fare for Boston Children.—The Boston Elevated Railway, Boston, Mass., announces that in July and August, and until Sept. 6, it will carry children under fourteen at half fare, or 5 cents, over all the lines.

Kankakee Line Granted Fare Increase.—A permanent order authorizing the Kankakee Electric Railway, Kankakee, Ill., to increase its cash rates from the 6-cent basis on which it has been operating for many years, to 7 cents was issued recently by the Illinois Commerce Commission. The company is further allowed to sell eight tickets for 50 cents. Shortly after applying to the commission several months ago, the company sought to adopt the new schedule, but an order from the commission suspended the 7-cent fare before it had been long in force. The permanent order was entered later.

Paving Charges May Be Modified.—The Board of Aldermen of Pittsfield, Mass., voted on June 14 to abate paving assessments, amounting to \$43,000, charged to the Berkshire Street Railway in 1919 and 1921.

For the Sightseer.—The 1926 edition of the booklet "Vancouver, as seen by means of the British Columbia Electric Railway Lines" is off the press. It contains full details of sightseeing trips about the city and up the Fraser Valley by railway and motor coach. Copies are mailed gratis on request.

Suggests Street Improvement.—A suggestion that the tracks on Olive Street in St. Louis, Mo., when that thoroughfare is widened from 60 to 100 ft. between Twelfth Boulevard and Channing Avenue be placed in a neutral zone from which other vehicles would be prohibited has been made to Director of Streets and Sewers Brooks by officials of the St. Louis Public Service Company, which will soon take over the United Railways. It was further suggested that if this is done the number of car stops between Grand Boulevard and Twelfth Boulevard be reduced from 21 to eight. It is estimated that this plan will cut the running time, will result in greater safety through segregation of vehicular traffic, a saving to the car rider of the cost of paving between the tracks, reduction in car noises and increase in comfort.

Recent Bus Developments

Railway's Rights Protected in Massachusetts

Certificates for three bus lines have been granted to the Service Bus Company of Revere, Mass., by the Public Utilities Commissioners. The line from Revere Beach to North Revere, passing over part of Park Avenue, has been operated for a time under temporary certificate, and Alphonso Roberto, head of the Service Bus lines, has run free buses on this route while waiting the decision of the commission. The other routes are from Point of Pines to Orient Heights, and from Revere Beach to Glendale Square, Everett. Because of protests by the Eastern Massachusetts Street Railway, all three permits carry definite limitations as to what part of the routes are open for receiving and discharging passengers.

Albany-Schenectady Service Sanctioned Over Railway Protest

The Public Service Commission on July 23 granted to William G. Schultze a certificate for the operation of a bus line between the Plaza in Albany, via Central Avenue, the Wolf, Wolf-Shaker and Consaul roads to Schenectady with a terminal at the Erie Boulevard in that city. Mr. Schultze cannot carry passengers in Albany in competition with the United Traction Company or in Schenectady in competition with the Schenectady Railway. His petition for operation was opposed by the Schenectady Railway and the New York Central Railroad.

Trackless Trolley to Go at Petersburg

The City Council of Petersburg, Va., has requested the Virginia Electric & Power Company to extend its Halifax Street car line to Butterworth's bridge. If the company complies, the entire length of Halifax Street will be covered by the car line.

The removal of the trackless trolley on Sycamore Street, Petersburg, extending to Wilcox Lake, is also proposed. The use of buses is suggested from Walnut Hill through Colonial Heights. This would give better service than is had at present, especially to those living in Colonial Heights.

Removal of the only "trollibus" system operating in Virginia would mean the end of an interesting experiment. About five years ago the trollibus was demonstrated for a week in Richmond. During that period several thousand persons rode free in the vehicle, which operated from Robinson Street west for a distance of several blocks. The Virginia Railway & Power Company, now the Virginia Electric & Power Company, applied for the establishment of several trollibus routes, but the proposal was not looked upon with favor by the city. Petersburg, near by, was,

however, in need of additional transit facilities and a system of trackless trolleys was installed there by a company separately organized but understood to be under the auspices of the Virginia Electric & Power Company.

More Talk of Independent Motor Bus Service in Des Moines

Officers of the Capital City Motor Coach Company, Des Moines, Ia., have announced positively that they will apply to the City Council for permission to operate a bus system in Des Moines. They have indicated that their proposal would be put up to the Council by Aug. 1.

As a forerunner of the announcement they brought a large Fageol bus to Des Moines and hauled councilmen over the routes which they propose to establish. They also promised 10-cent fares and a special weekly ticket good for an unlimited number of rides. The service the officers of the company say it is proposed to install would compete with the railway lines of the Des Moines City Railway.

Observations on One Year's Bus Operation in Kansas City

The first anniversary of the starting of bus service by the Kansas City Railways in Kansas City, Mo., was celebrated on July 20. The Leeds route was the first to be placed in operation. All of the other routes were started on schedule within the next three months in the following order: Blue Valley Route, Aug. 19; South Troost Route, Aug. 19; Northeast Route, Aug. 19; 39th Street Route, Sept. 21; Warwick Route, Oct. 19; Armour-Paseo Route, Oct. 20; Linwood-Benton Route, Nov. 4; Country Club Express, Nov. 4. The Argentine bus line in Kansas City, Kan., was placed in service a year ago last January.

Since the first bus started on its schedule a year ago the combined bus routes in Kansas City show a deficit of \$206,474, inclusive of the interest of the investment. The total earnings of all routes to July 20 was \$462,465.

Despite the difficulties of bus operation in Kansas City the company is believed to be operating as cheaply as any bus line in other cities. In probably no other city are grades found as severe as those in Kansas City. No line there has a grade less than 5 per cent, while some of the grades are as great as 13 per cent.

From observation and by comparing the railway receipts with the receipts of a similar period last year it would seem that about 60 per cent of the revenue of the buses represents that much loss to the railway lines.

Since May 1, however, the ten bus lines of the Kansas City Railways have shown a big increase in patronage, according to Senator Francis M. Wilson,

one of the receivers. Use of the buses as chartered cars for parties, picnics and drives over the boulevards has increased, too.

Demands for buses by large parties usually come at night after the rush hours. It is a profitable section of the transportation business, and the receivers have exerted much effort toward attaining it.

Conventions, societies, clubs and other organizations have found it convenient to use buses for special trips. And this demand is growing rapidly as more organizations become familiar with the custom. The receivers frequently are called on to furnish buses to meet trains at the Union Station to give brief visitors a view of Kansas City by groups.

The charge is \$7.50 an hour for single-deck buses, with special arrangements where intervals of waiting are desired.

Excursions by Bus Prove Popular

Last month the traffic department of the Interstate Public Service Company, Indianapolis, Ind., put into operation a number of personally conducted buses carrying summer excursionists to various points of scenic interest in Indiana. As indicated previously in the *ELECTRIC RAILWAY JOURNAL* the first trip was made from Indianapolis to Brown County, which is famed throughout the country for its rugged scenery and primitive background. The Interstate is using for these excursions some of its new de luxe buses. On June 20 the second excursion was run from Indianapolis to the Shades of Death, a beautiful spot in eastern Indiana. Similar excursions were scheduled for July 11 from Indianapolis to the noted Turkey Run, State Park in Parke County, and on July 25 to McCormick's Creek Canyon, another park which the state is beautifying. On Aug. 8 the Interstate will run one of the bus excursions to Clifty Falls, near Madison.

Rights of Blue Goose Line Expanded

The Blue Goose Motor Coach Line, subsidiary of the East St. Louis & Suburban Railway, and operation between St. Louis, Mo., and Belleville, Ill., has been authorized by the Illinois Commerce Commission to do an intrastate as well as interstate business between its terminals. The new arrangement went into effect on Sunday, July 18.

Heretofore the buses were not permitted to make any stops to pick up passengers along the route. Originally the line was run in opposition to the East St. Louis & Suburban Railway, which opposed all efforts to obtain a certificate of convenience and necessity from the state commission and required the bus company to confine its operations to a strictly interstate business.

The new route of the buses is from St. Louis via the Eads Bridge to Broadway, East St. Louis, east to Main Street, north to Missouri Avenue, east to Eighteenth Street, north to Illinois Avenue, east to 26th Street, north to State Street and thence east on State Street to Belleville. The Belleville terminal is on Court House Square.

Co-ordinated Service for Menominee

An attempt will be made by the Menominee & Marinette Light & Traction Company to sell the people of Marinette and Menominee, Mich., on the numerous advantages of co-ordinated railway and bus service, in line with its policy to bring its transportation system up to the highest degree of efficiency. To do this, a 21-passenger bus has been purchased for use on an experimental basis on various lines in Marinette and Menominee. The company expects in this way to learn under actual conditions the value of using buses with street cars in the Twin Cities. Bus fares will be the same as on the street cars with transfer privileges to both lines. On the sentiment of patrons will depend future action by the company with respect to its efforts to improve its service.

Additional Buses in Omaha.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has added three buses to its present fleet. Each seats 21 passengers, a capacity which Manager Leussler finds to be most flexible and economical. So far the company has been using buses as feeders to reach out for new business in sections of the city now being developed.

Another Bus Line for Tampa.—The Tampa Electric Company, Tampa, Fla., recently received permission from the City Commission to operate a bus line from down-town Tampa to the new Uceta shops. Buses will run every twenty minutes during the heavy traffic hours and every half hour during the rest of the day.

Milwaukee to Have Bus Stop Signs.—In compliance with an ordinance recently passed by the Common Council affecting city operation of buses, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has agreed to install about 546 "Bus Stop" signs at all corners where the company buses halt to receive or discharge passengers. These metal signs will be mounted on 8-ft. steel posts. The lettering is in chrome yellow on a coach green background.

Unconvinced About Substitution.—A survey recently made at Staunton, Va., of conditions affecting bus service there has left the Shenandoah Traction Company unconvinced of the desirability of replacing or supplementing its trolley system with buses. The City Council, on the other hand, has expressed approval of the establishment of a bus system at Staunton. It has been determined to offer the railway the first chance at the franchise for bus service, in order to protect it from competition.

Extension of Kansas City Line.—With the paving on Troost Avenue from 63d Street to the city limits at 79th Street practically completed, the Kansas City Railways, Kansas City, Mo., will extend its Troost Avenue bus service to the southern city limits about Aug. 1. The line is now operating from 63d Street, where the paving now ends, to 55th Street, connecting with the South Troost car line at that point.

Financial and Corporate

Financial Status Sound

Toronto Transportation Commission Reports Decrease in Passenger Revenue Not Serious

The gross income of the Toronto Transportation Commission, Toronto, Canada, which operates the local railway and bus lines there, for the year ended Dec. 31, 1925, was \$11,626,659, or a decrease of \$83,037 compared with 1924. This fact was disclosed in the annual statement of the commission. The surplus as of Dec. 31, 1925, after making certain adjustments and adding the surplus for the year 1925, was \$310,314.

The revenue account shows that the decrease in passenger traffic which was experienced in 1924 continued during most of 1925. The decrease in the number of revenue passengers carried in 1925, compared with the number in 1924, was 4,423,773, the number in 1925 being 180,779,925. This decrease is attributed mainly to the continuance of quiet business conditions and, secondarily, to the increasing use of private automobiles. The report states, however, that there is some encouragement to be derived from the fact that the monthly losses were much less severe in the summer of 1925 and were practically eliminated in the latter months of the year.

COMPARATIVE STATEMENT OF EARNINGS OF TORONTO TRANSPORTATION COMMISSION

	1925	1924
Income:		
Passenger earnings:		
Railway and bus transportation.....	\$11,157,893	\$11,422,689
Motor coach transportation.....	132,008	.....
Income from sundry other sources.....	336,757	287,005
Gross income.....	\$11,626,658	\$11,709,695
Expenditure:		
Cost of electric current, including operation and maintenance of sub-stations.....	\$1,108,942	\$1,108,889
Expenses of operation, maintenance, repairs, administration and taxes, including accrued charges.....	6,183,356	6,679,674
Expenses of operation:		
Motor coaches.....	95,271	.....
Total expenditure.....	\$7,387,570	\$7,788,563
Net income available for fixed charges....	\$4,239,087	\$3,921,131
Fixed charges:		
Interest, less interest on idle funds.....	\$2,207,819	\$2,242,237
Reserves on capital account:		
Redemption of debenture debt.....	873,883	491,148
Reserve for replacements.....	909,352	794,550
Reserves on operating account:		
Reserve for unredeemed tickets.....	.....	18,000
Reserve for workmen's compensation and public liability.....	126,968	240,000
Reserve for contingencies.....	50,000	30,000
Reserve for doubtful debts.....	13,000	16,008
Organization expenses.....	.....	.....
Total fixed charges and reserves.....	\$4,181,024	\$3,831,944
Net income carried to surplus	\$58,063	\$89,187

The expenses of operation of the commission for the year 1925, including the cost of electric current, maintenance, repairs, administration and taxes, but exclusive of the expenses of operation of the motor coach services, amounted to \$7,292,298. This total compares with \$7,788,564 in 1924, or a reduction in operating expenses of nearly \$500,000.

The necessity for operating economies, according to the statement, is obvious from a glance at the revenue table. Compared with 1924, not only was there a decrease of \$264,796 in the passenger earnings in 1925, but there was an increase of \$348,318 in the debt charges, that is the interest and sinking fund payments on the outstanding debentures. These large annual increases in debt charges, which have been due to sinking fund payments becoming effective gradually, will not continue beyond 1926.

The net income of the commission available for fixed charges and surplus was \$4,239,087, after deducting operating expenses. The report says that the "amounts appropriated from this sum for operating reserves are all reasonable and are the minimum that should be set aside to protect the investment." It was necessary to increase the appropriation for the reserve for replacements because of additions to the property and particularly because of the additional capital invested in motor coaches.

The amount appropriated for the reserve for workmen's compensation and public liability has been reduced from \$240,000 in 1924 to \$126,968 in 1925. The record of accidents on the system has been such as to justify this reduction. From Sept. 1, 1921, when the commission assumed control of the system, to the date of the report, the street cars, buses and coaches of the commission have traveled 126,500,000 miles and carried 1,320,000,000 passengers, and not one passenger has been fatally injured.

The commission was successful in still further increasing its earnings from other sources, the income amounting to nearly \$50,000 more than for the year 1924. A new source of earnings was also developed during the year with the start of special motor coach transportation. This service includes sightseeing trips, the rental or chartering of motor coaches to private parties, coach transportation to the racetracks and to the Canadian National Exhibition, transportation of school children and a regular scheduled service to the "Hill" district, all of which is conducted as a separate enterprise and distinct from the street railway and bus system. The expenses of operation of motor coaches totaled \$95,271 and this sum included all organization and development expenses in connection with starting this branch of the transportation service.

The total earnings from motor coaches were sufficient to pay all oper-

ating expenses and fully to meet all fixed charges on the capital invested in motor coaches, the garage and other equipment used in this service and return a small surplus. From May, when operation started, to December the earnings were \$132,008.

General Manager Harvey, in his report, makes the distinction between the motor bus and motor coach services operated by the commission. Motor buses are operated as a part of the universal fare transportation system, with free transfers issued between the street cars and the buses, the latter being painted the same color as the street cars. The motor coaches are better-equipped vehicles and are painted a distinctive gray. They are operated in special transportation services for which special rates are charged. He states that the chartered coach business has been entirely satisfactory. The volume of business secured greatly exceeded that expected. The financial results of the motor coach services as a whole were satisfactory, "notwithstanding the Hill coach route experiment."

Track extensions built in 1925 were 7.931 miles and track removed 2.901 miles, so that net addition to trackage in 1925 was 5.030 miles. Several important constructions were included in this mileage. The only important addition to the buildings of the commission was the construction of a garage on the Davenport Road frontage of the Hillcrest property. No passenger street cars or electric service cars were secured in 1925. During the past year 21 coaches were added to the service.

In conclusion, Mr. Harvey states that an examination of the balance sheet

and other financial statements indicate clearly that the financial condition of the commission is fundamentally sound. The year's decrease in passenger revenue, though disappointing, is not of serious consequence. Traffic has been increasing for the past few months and there are indications of improvement in general business conditions.

He refers to the sound field of usefulness for the bus in interurban transportation, where its use has increased rapidly in the Toronto district. In his opinion the situation in respect to traffic congestion has not altered during the past year except that such congestion has increased, to the further inconvenience and expense of the vast majority of the users of the roadway allowance. The congestion is particularly acute in the downtown district. The commission intends to try to secure the co-operation of large employers and owners of amusement places toward improving the service by adopting "staggered hours."

Community Traction Loss \$20,000 in June

A deficit of \$20,199, resulted from operation of the Community Traction Company, Toledo, Ohio, during June. Although there was a decrease in passenger business as compared with the previous month a slight gain was shown over the same month last year. Revenue passengers for June totaled 3,912,600, or an average of 130,420 a day. Passenger revenue was \$274,569, or an increase of \$4,279 over the same month in 1925. Loss of revenue from interurban track rentals and additional car

mileage resulted in slightly higher operating ratio and a lower net result. The operating ratio in June, 1926, was 74.54 per cent, compared with 71.66 per cent for the similar month last year.

Well-Known Engineer Made Receiver of Minnesota Interurban

In connection with a suit to foreclose the bonds of the Minneapolis, Anoka & Cuyuna Range Railway in the District Court of the United States, Judge John B. Sandborn has issued an order appointing Edward P. Burch, Minneapolis, receiver for the road, to take effect immediately. The railway runs between Minneapolis and Anoka, 18 miles. It is engaged very largely in freight service. There are also eight passenger trains a day between the two cities.

The road and equipment have a book value of \$672,000, against which there are \$380,000 of mortgage bonds. The capital stock is owned very largely by the Bratnaber family of Minneapolis and St. Paul.

Revenues have decreased from about \$156,000 in 1920 to about \$94,000 in 1925, due largely to a decrease in the passenger transportation. The carload freight business, hauled by 50-ton electric locomotives, has increased.

The receiver will not make important changes in operation, but he has under consideration the lease of flat cars to increase the freight service and the overhauling of cars to attract passenger traffic.

Mr. Burch has maintained an engineering office in Minneapolis for 25 years, and during the last five years has been valuation engineer and a director of the Minneapolis, Northfield & Southern Railway. He was electrical engineer for the Twin City Rapid Transit Company's system during its initial construction period.

Conspectus of Indexes for July, 1926

Compiled for Publication in This Paper by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				June 1926	July 1925
Street Railway Fares*	July 1926 1913 = 4.84	June 1926 7.36	July 1925 7.37	June 1926 7.37	July 1925 5.83
Electric Railway Materials*	July 1926 1913 = 100	June 1926 154.1	July 1925 152.6	Sept. 1920 247.5	Oct. 1924 148.5
Electric Railway Wages*	July 1926 1913 = 100	June 1926 225.7	July 1925 222.5	Sept. 1920 232.0	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	July 1926 203.2	June 1926 201.9	July 1925 200.1	July 1920 256.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	July 1926 207.8	June 1926 201.8	July 1925 204.6	June 1920 273.8	Mar. 1922 162.0
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	June 1926 152.3	May 1926 151.7	June 1925 157.4	May 1920 246.7	Jan. 1922 138.3
Bradstreet Wholesale Commodities 1913 = 9.21	July 1926 12.74	June 1926 12.80	July 1925 13.85	Feb. 1920 29.87	June 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	July 1926 159.7	May 1926 161.1	June 1925 155.0	July 1920 219.2	Mar. 1924 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	June 1926 167.0	May 1926 167.8	June 1925 166.9	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	June 30 1926 3.479	May 31 1926 3.649	June 30 1925 3.710	July 31 1920 11.113	July 31 1924 3.187
Bank Clearings Outside N. Y. City (Billions)	June 1926 18.93	May 1926 18.17	June 1925 18.36	Oct. 1925 20.47	Feb. 1922 10.65
Business Failures Number	June 1926 1574	May 1926 1610	June 1925 1.37	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	June 1926 6.24	May 1926 7.64	June 1925 3.71	Jan. 1924 127.05	Aug. 1925 77.77

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. Previously the wage index applied to 144 railways. The change is due to dropping some roads where the number of trainmen has been reduced to a total of less than 100.

Income of Brooklyn City Road Holds Up Well

The Brooklyn City Railroad, Brooklyn, N. Y., reports a net income for the twelve months ended June 30 of \$1,422,736, compared with \$1,432,308 for the same period last year. The preliminary income statement follows:

	Twelve Months Ended	
	June 30, 1926	June 30, 1925
Passenger revenue	\$11,399,374	\$11,363,281
Other revenue	371,399	402,339
Operating expenses and taxes	9,731,812	9,826,870
Income deductions	616,225	506,442
Net corporate income	1,422,736	1,432,308

Disposal of \$120,000 in Interest Puzzles San Francisco Municipal

More than \$120,000 in interest has been earned by the San Francisco Municipal Railway, San Francisco, Cal., from funds deposited in banks during the past ten years, and the money has been credited to the municipality's general fund instead of the railroad operating revenue fund. This fact is stated in a report made to the Board of Public Works by Fred Boeken, superintendent of the city lines. Mr. Boeken contended

that the money earned by the city road should be deposited to the credit of the utility and will do much to reduce the so-called "book deficit." President Timothy A. Reardon of the Board of Works stated that the Board of Supervisors will be asked to enact legislation providing for the change in financing.

Details of California Financing Announced

During the twelve months ended June 30, 1926, the California Railroad Commission passed upon applications filed by public utilities and common carriers operating in California involving the issue of \$271,024,507 of stock, bonds, notes and equipment trust certificates, as compared with \$197,412,807 for the preceding twelve-month period ended June 30, 1925, the increase amounting to \$73,611,699.

The securities passed upon during the two periods were disposed of as follows:

	Year Ended June 30, 1925	Year Ended June 30, 1926
Granted	\$175,795,119	\$262,463,149
Denied	19,900,400	274,960
Dismissed	1,717,288	8 286,398
Total	\$197,412,807	\$271,024,507

The securities were authorized to be issued by the various classes of utilities and carriers as follows:

Class	Year Ended June 30, 1925	Year Ended June 30, 1926
Steam railroads	\$4 023,150	\$658,000
Electric railways	3 515,496	4,362,461
Gas and elec. companies ..	116 684,856	241,314,100
Water companies	7 339,346	5,046,782
Telephone and telegraph companies	41 982,306	1,947,913
Warehousemen	668,700	1,259,320
Carriers by water	193,000	2,891,000
Automotive carriers	1 388,264	4,983,572
Totals	\$175,795,119	\$262,463,149

Providence Merger Plans Maturing

The tentative plan for a merger of the Narragansett Electric Lighting Company and the United Electric Railways, Providence, R. I., under the charter of the United Electric Power Company as provided for at the last session of the General Assembly involves the formation of a new Rhode Island corporation and the purchase of the assets of Narragansett Electric by the United Electric Power Company. The new corporation would act as a holding company for the United Electric Railways and United Electric Power. The United Electric Power Company may purchase the properties of the Narragansett Electric.

Receiver Named for Michigan Interurban

The Grand Rapids Trust Company, Grand Rapids, Mich., was appointed receiver of the Grand Rapids, Grand Haven & Muskegon Railway on July 29 by Federal Judge Clarence W. Sessions. This action is the result of a petition of the Guaranty Trust Company, New York, trustee, alleging that the interurban has failed to pay the principal of \$1,500,000 on a bond issued due on

July 1, 1926, and \$75,000 bond interest due on Jan. 1, 1926.

The Grand Rapids, Grand Haven & Muskegon Railway was constructed by Westinghouse, Church, Kerr & Company, New York. It was placed in service in 1902. The United Light & Railways Company acquired the property in 1912 and in 1925 it passed into control of the present owners, among them some of the officers of the company. According to a bill in the federal court the deficit in 1924 was \$20,000, in 1925 \$80,000 and for the first six months of this year \$30,000.

Road at Hornell Sold Under Foreclosure

After 30 years of operation the Hornell Traction Company, Hornell, N. Y., has suspended service on its city and Hornell-Canisteo lines. On July 15 the railway was sold in a mortgage foreclosure action to Raymond E. Page, receiver, who held the mortgage and is the promoter of the bus lines. He bid \$14,600 and thereby became sole owner. The mortgage was for \$150,000.

The rails will be torn up and junked and the rolling stock sold.

Buses started operation immediately, both in the city and on the Hornell-Canisteo line. Practically the same schedule as maintained by the street cars was put in operation. Fifteen-minute service will be given in the city and half-hour service to Canisteo, a nearby suburb. The city buses are of 29-passenger capacity and the interurbans carry 35 fares.

Declaration of Abandonment at Chautauqua Approved

How is Chautauqua going to solve its transit problem this summer with an influx of 40,000 or 50,000 institute students swelling the usual population of about 1,000 people? The solution probably lies in the hope that with the inheritance of the Chautauqua Traction Company's transportation routes, the West Ridge Transportation Company and the Jamestown Street Railway will, with the aid of the Board of Education and the institute officials, be able to find a way out of the difficulty and avert serious congestion. Buses of the West Ridge company have been carrying the 144 school children living in this area, since the school board signed a contract with the company on March 15.

For 23 years the Chautauqua Traction Company has been meeting the situation and serving the increased carriage of passengers of the summer months in an adequate way. But on March 22, as mentioned in ELECTRIC RAILWAY JOURNAL for April 3, a petition for the declaration of abandonment of service for 22 miles of trackage between the towns of Mayville and Ashville was approved by the Public Service Commission. Reasons for the dissolution as approved by the commission are presented in the accompanying table and a brief résumé of the traction company's unfortunate financial history. The losses incurred are shown by comparison of the statements for years from 1919 to 1925. This statement does not take into consideration interest on

fixed charges or return on the capital invested.

Year	Operating Revenues	Operating Expenses	Taxes	Loss
1919	\$154,647	\$158,906	\$10,716	\$14,974
1920	182,132	197,742	11,330	26,939
1921	212,120	214,669	13,891	16,440
1922	180,361	187,701	15,113	22,454
1923	151,681	198,224	16,648	63,190
1924	150,802	181,761	17,701	48,660
1925	115,076	147,064	17,395	49,383

"From the time of its incorporation in 1904 to 1918 the Chautauqua Traction Company earned its operating expenses. Since 1909, however, it failed to earn its operating expenses, taxes and fixed charges. Except in the summer months, the traffic has not been sufficient to warrant continued operation. With the improved highways and the increased use of automobiles, discontinuance of the line seemed inevitable," was the opinion of the commission. The rather free use of passes was also taken into consideration.

However great the need, a company cannot operate without sufficient funds. The case having been weighed carefully, with particular consideration given to the facts stated, the Public Service Commission has approved the declaration of abandonment.

Market Street Reports \$448,464 Net Earnings for Six Months

The Market Street Railway, San Francisco, Cal., reports net earnings of \$448,464 for the six months ended June 30, 1926. The statement follows:

Operating revenues	\$4,882,501
Operating expenses	3,688,114
Net revenue	1,194,387
Taxes	305,000
Operating income	889,387
Non-operating income	28,440
Gross income	917,827
Deductions	469,362
*Net income	\$448,464
*Prior to deducting federal income tax.	

Applies to Abandon Amsterdam Line.—A further hearing was held on July 13 before the Public Service Commission in Albany on the application of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., to abandon a portion of its railway in Amsterdam. At the hearing the petitioner presented proof showing the amount of traffic over the section of the line proposed to be abandoned and the revenues from the line for a period of years. The abandonment was opposed by the corporation counsel of Amsterdam. Decision by the commission was reserved.

Profit for Oklahoma Railway in June.—Receivers of the Oklahoma Railway, Oklahoma City, Okla., announce that receipts for June wiped out the deficit faced by that company for more than a year. As the summer months usually prove the dullest period of the year the receivers are much encouraged and June figures are believed to justify the hope that the coming fall and winter receipts will show the company permanently out of the "red." The increased business is believed to result from decreased use of private automobiles by citizens.

Personal Items

S. H. Serena Now with Staten Island Lines

Samuel H. Serena has been appointed general superintendent of the Richmond Light & Railroad Company, also the New Jersey & Staten Island Ferry Company at Staten Island, New York. This property is controlled by the J. G. White Management Corporation, New York.

Mr. Serena entered electric railway work in May, 1899, as a trainman with the New York & Queens County Railway, Long Island City, advancing to inspector, dispatcher and chief dispatcher. In December, 1907, the year the Public Service Commission was created in New York State, he became connected with the commission in the transit bureau.

There Mr. Serena remained until Aug. 1, 1909, when he was appointed superintendent of transportation of the New York & Queens County Railway. This system, one of the large ones in Greater New York, serves most of the Borough of Queens and operates 300 cars daily. While he was superintendent of the Queens lines Mr. Serena and Charles S. Banghart, now vice-president and general manager of the Staten Island Edison Corporation, the Richmond Light & Railroad Company and the Staten Island and New Jersey Ferry Company, operated the first cars through the Queensboro tunnel and also over the Queensboro Bridge. Mr. Banghart, who at the time was general superintendent of the Queens Lines, acted as motorman and Mr. Serena as conductor when city, borough and railway officials made the first inspection trips.

Mr. Serena became superintendent of railways with the East Penn Electric Company on Jan. 15, 1923, with headquarters at Pottsville, Pa., operating interurban and city lines in the anthracite coal regions. This property was controlled by the J. G. White Company until early last year, when it was sold to the Pennsylvania Power & Light Company.

George Wood has been made an assistant secretary of the New York Transit Commission effective Aug. 1. At the present time Mr. Wood is a reporter and political correspondent on the New York World. He has been a newspaper man since 1908. In 1906 Mr. Wood was confidential secretary to William J. Connors, chairman of the Democratic state committee. The following year he became associated with Lieut.-Gov. Lewis Stuyvesant Chanler, as confidential messenger. He went to the New York Herald as correspondent in 1908 and served until 1913. Representative Woodson R. Oglesby, Democrat, of the Bronx-Westchester district, named Mr. Wood as his secretary in 1913, and he served in this capacity until 1915, when he went with the

Evening Sun. Mr. Wood was with the American Expeditionary Forces during the period of the World War. At the conclusion of his service in the army he became Albany correspondent of the *Globe*. Later he joined the staff of the *World*.

New Aurora Manager

J. W. Gunderson, Recently Appointed Operating Head of Illinois Road, Rose from Ranks

From conductor to general manager in 25 years is the record friends of John W. Gunderson point to in congratulating the Elgin division superintendent of the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., upon his appointment as general manager of the traction system.

Mr. Gunderson's appointment, made



J. W. Gunderson

by B. E. Walsh, operating vice-president of the organization managing the traction, gas and electric light and power interests of Col. Ira C. Copley of Aurora, was announced by John F. Egolf, Aurora, general manager of the company, who resigned recently to accept a position as assistant to the vice-president of the Chicago Rapid Transit Company. Mr. Gunderson will retain his residence in Elgin, but his offices will be in Aurora.

In October, 1901, Mr. Gunderson entered railway work during the construction of the Elgin third-rail line. Subsequently he worked as a conductor on the third-rail, then dispatcher and, lastly, Wells Street yardmaster. On April 1, 1906, he went to Elgin as division superintendent of the local traction system and for the past twenty years, until his elevation to the general managership, he has held that position. During his work in Elgin the Park Street line and the Wing Park link were constructed and the headways on the various street lines were cut.

Sixteen of the intimate friends of Mr. Gunderson and Mr. Egolf feted the two officials recently with a chicken dinner

and informal program at the Addison Inn. Impromptu remarks complimentary to both guests were delivered by all present, with Edward N. Herbster acting as master of ceremonies.

In his new position Mr. Gunderson will be over more than 400 employees of the Fox River Valley Traction system, besides having general charge of the various departments of the company, including the auditing, shops, maintenance, operation, and service. The traction system includes 67 miles of street and interurban railway lines in Elgin, Aurora, and between the two points, also the Elgin-Carpentersville line and the Aurora-Yorkville line.

Mason B. Starring has resigned the presidency of Market Street Railway, San Francisco, Cal. No successor has been appointed. Halford Erickson and William Abbott have been elected to the board and have been named vice-presidents, in addition to Mr. Erickson becoming general counsel and Mr. Abbott secretary.

Obituary

H. C. Moser

Herbert C. Moser, general manager of the Chicago Motor Coach Company and formerly superintendent of transportation of the Fifth Avenue Coach Company, New York, died at Johns Hopkins Hospital, Baltimore, on July 23. Mr. Moser had not been in the best of health for some time and went to Baltimore to have a complete diagnosis and survey made. The direct cause of death is understood to have been heart trouble.

The passing of Mr. Moser removes a man who has been identified with both rail and bus operations throughout his entire career. He entered the employ of the old Metropolitan Street Railway system of New York City in the late '90s as a register boy on the Fourteenth Street crosstown line. He later became chief clerk in the office of Mr. Delaney, general superintendent of transportation. He was in the electric railway field for about fifteen years before joining the Fifth Avenue Coach Company in 1912 as superintendent of transportation. He continued with that company until March, 1923, when he left to take charge of the transportation department of the then recently organized Chicago Motor Coach Company. His elevation to the rank of general manager of the latter company followed soon afterward.

Entering the field of bus operation at its virtual inception as he did, Mr. Moser became a widely recognized authority on this form of transportation. He is credited with having prepared the first bus operating time-table in this country.

Thomas F. Keefe, division manager for the Wisconsin Light & Power Company at Beloit, died suddenly on July 5 after an attack of heart disease. Mr. Keefe was 50 years of age. He had been manager of the Beloit plant for a year.

"Don't Wait for Passengers," Says John G. Barry— "Go After Them"

Vice-President of General Electric Company Presents a
Convincing Analysis of the Electric Railway Outlook
and Suggests Practical Ways to Improve the Business

AN INTERVIEW

By Charles Gordon

ONLY a few steps are necessary to put street car operation on a profitable basis and to improve its position as a transportation tool. Better looking cars of light weight and equipped with modern apparatus can at one time be made the means of attracting increased patronage and reducing operating and maintenance costs. If in addition these cars are manned by men who have been adequately trained in the idea of selling their service to their patrons, as have the men on Mr. Budd's line between Chicago and Milwaukee, there is little need for concern about the future of electric railway transportation.

"In the smaller cities automobile competition can be met by an increased number of small, attractive, light-weight cars operated by one man, in place of old and heavy equipment, which in addition to its high operating and maintenance cost is awkward looking and unattractive to passengers."

This, briefly, was the view of the electric railway situation expressed to me by J. G. Barry, vice-president in charge of sales of the General Electric Company. I talked with him in his office in Schenectady, and although he carries the responsibility for directing the sales activity of this huge organization, he was unhurried and willing to discuss at length the condition of the industry through which he has risen literally from the ranks to his present position of responsibility. Although I knew that even as I questioned him many matters of importance were awaiting his attention, I found him willing to discuss the transportation situation at length and apparently glad to listen to my views as well as to express his own.

ONE WHO GETS THINGS DONE

Right there seems to lie one of the secrets of Barry's success. He is one of those rare individuals who never seem to be hurried. He always seems to have time to dig to the bottom of a subject—and incidentally he doesn't lose any time or mince any words in getting there. Along with that rare quality goes another. Throughout the enormous organization of which he is a part he has a reputation for getting things done! That apparent ability to pick up any job turned over to him and see it through to completion accounts in a large measure for his steady rise from a modest job in the production department of the Lynn works in 1890 to his present position of vice-president in charge of sales.



J. G. Barry

Mr. Barry talked on the basis of a long and intimate acquaintance with the electric railway industry. By far the greatest part of his time with the General Electric has been spent in the railway department. Two years after he joined the company, at the age of 20 in 1890, he was transferred to the railway department in the Boston office. From that time until he was made a vice-president in 1922 his primary interest was in the electric railways. By 1897 he had become assistant manager of that department and ten years later, in 1907, he became manager. For another period of ten years he continued his railway activity and then in 1917, in addition to maintaining his direct interest in the railway department, he was made general sales manager of the company. It was not until he became a vice-president in 1922 that he relinquished active supervision of railway development.

Back in his early days with the production department at Lynn Mr. Barry's chief duty was to look after the repair of armatures and other motor parts that were sent in by operating railway companies. In those days the railways were just in the process of changing to electric propulsion and had not become equipped to make their own repairs. For that reason "burned out" armatures were sent back to the manufacturer for such work. This old s.r.g. equipment kept John Barry busy, and besides initiating him into the electric railway business, gave him a contact with the work of maintenance

forces which he has never forgotten.

Although he approached the general subject of our discussion from a manufacturing and merchandising standpoint, he nevertheless quickly reflected that early familiarity and experience with the maintenance man's viewpoint and problems. I asked Mr. Barry about financing replacements of old-fashioned, heavy and obsolete equipment.

"In most cases the equipment trust method offers the means of acquiring new equipment, and the opportunities for savings in operation and maintenance make it possible on many properties to finance new cars by this method on terms that practically enable them to pay for themselves out of the savings effected.

"Right here, however, the railways can do a great deal to reduce the cost of new equipment. There has been a tendency to over-refinement by operating companies in specifying special requirements, sometimes in comparatively minor details of equipment design or dimensions. Of course the manufacturers have tried to meet such demands on the part of their customers. In some cases, even after standards have been adopted by official committees of engineers working through the American Electric Railway Engineering Association, individual companies have frequently insisted on certain changes, sometimes comparatively minor in their nature. The result invariably has been seriously to increase the cost and price, to say nothing of the delays in deliveries that have resulted.

CAUSE OF WASTE NOT REALIZED

"Sometimes the operating man does not quite realize the serious consequences of seemingly minor changes in the design or the dimensions of a motor part to meet his particular ideas of good practice. Detailed engineering instructions must be prepared by the manufacturer to cover the change from his standard design. Drawings must then be changed, and frequently special patterns or dies have to be made. All this must be absorbed in the manufacturing cost, if the manufacturer is to stay in business.

"What about reducing the number of sizes and types of cars and motors that must be manufactured at present," I asked.

"There again you have a condition that increases the cost and therefore the price of cars and parts," replied Mr. Barry promptly. "Consequently, the net result is to make more difficult the problem of providing modern equip-

ment, since the cost is higher than it would be if the number of types or sizes manufactured could be reduced. We believe that the large number of different types, sizes and varieties of cars, trucks and electrical equipment now desired by operating companies could be substantially reduced if careful attention were given to the elimination of special demands in such equipment, so as to permit manufacture on a quantity production basis."

At this point Mr. Barry warmed up to his subject and questions on my part were unnecessary. His thoughts were expressed in that simple, straight from the shoulder manner that is characteristic of the man. I interrupted once or twice to make sure I had grasped his point. But as he continued to express his ideas I was impressed by the directness with which he probed to the heart of the electric railway situation, pointing out how and why we have fallen behind the stream of industrial progress which goes steadily forward.

INDUSTRY MAY PROFIT BY EXAMPLE

Mr. Barry is not a railway operator, but he knows marketing and he knows selling. He knows how to adapt a product to the demands of customers, and that is just what the electric railway industry must learn. Railway operating executives are manufacturers of transportation and they must sell their product to the traveling public. Until only recently that was unnecessary, since there was no other choice, and the primary objective was to furnish transportation to those who came for it. Since electric railways have awakened to the need for selling their service, some operators have experienced considerable difficulty in acquiring a true sales viewpoint, including appreciation of the importance of adapting the product to make it salable.

As I listened to Mr. Barry I wished that every electric railway operator might have the opportunity of hearing so simple and direct an analysis of the industry's merchandising shortcomings. I visualized a comparison between an antiquated electric railway and an out-of-date merchant—a merchant who at one time enjoyed a monopoly of his product, but who with the coming of competition contents himself with an appeal to his former customers to patronize the old reliable dealer, instead of revamping his stock in trade, sprucing up his store and then going after the business on a modern basis.

"There is nothing fundamentally the matter with the street car," said Mr. Barry. "It is encountering competition of a high quality product at a much higher price, and has not been adapted to meet the new conditions. Most of the trouble due to falling off of passengers has been due, first, to the novelty of the automobile and, second, to the failure on the part of operators to improve the character of their service to meet the higher standard of popular transportation demand. This has moved forward along with the general advance in the standard of living. Although the electric railways are giving more transportation than ever before for a given cost, and are still

the most economical and efficient agency for moving large numbers of people between their homes and places of business, they encounter a popular taste in transportation that has grown beyond the character of service which they give with existing equipment.

"Today's transportation problem is not exclusive with the street car. There is no question involved of the relative advantages of cars and buses. That is working itself out rapidly to the point where the proper place of the bus is becoming better understood. The problem is as acute in the case of steam railroads as it is in purely local transportation. The struggle is not between any two forms of common-carrier vehicles, but is between all common-carrier agencies and the individually owned automobile. The question at issue is whether various forms of common-carrier transportation can be made sufficiently attractive to compete with the much higher cost of the more convenient and flexible private car.

"I feel strongly that adequate rehabilitation of electric railways and intensive merchandising of their service will put them on an attractive earning basis. The results accomplished by the Insull properties in the Chicago district are ample testimony to the effectiveness of this procedure. A greater uniformity in the size and type of equipment requirements would result in lower cost, better delivery and accelerated development by manufacturers. I feel confident that the electric railway industry has passed the peak of its troubles and is definitely headed toward improvement. Traffic congestion and parking difficulties are limiting the advantages of the automobile. It now remains only for electric railways to take advantage of the situation by forging ahead on a program of improving their equipment and service with a view toward winning patronage and rates of fare adequate to put their operations on a profitable basis."

Important Consolidation of Effort in European Distribution

Offices of the American Locomotive Company, the American Car & Foundry Company and the Railway Steel Spring Company in the leading capitals of Europe have been consolidated, according to F. F. Fitzpatrick, president of the American Locomotive Company, who recently returned from a tour of the Continent. The move is expected to bring about the increased efficiency and

economy held to be necessary for the proper European distribution of American manufactured products.

Commenting upon the need for efficiency in European distribution of American goods, Mr. Fitzpatrick said:

If American industry is to compete seriously in the European market the utmost economy in operation is essential. Under the leadership of W. H. Woodin, president of the American Car & Foundry Company and also chairman of the board of directors of the American Locomotive Company, the three companies have been brought into the closest co-operation.

Twenty-fifth Anniversary of Electric Locomotives

In order to handle its rapidly increasing traffic, the St. Louis & Belleville Electric Railway has obtained a new 80-ton electric locomotive to assist two similar 50-ton locomotives which have rounded out a quarter century of service. The railway operates an electric line between Belleville and East St. Louis, the principal commodity being coal. Since February, 1925, it has been hauling all the coal used in the superpower plant at Cahokia, on the east bank of the Mississippi at East St. Louis.

The new locomotive is the swivel-truck type, of General Electric manufacture. It is equipped with four GE-69 railway motors and type M control. The equipment is housed under sloping cabs at each end, and power is taken through pole trolleys. The motors are geared for a maximum speed of 33 m.p.h., with a continuous rating of 16,300 lb. tractive effort when operating at 16.7 m.p.h.

The shipment of this locomotive recalls the fact that two General Electric locomotives on this railway recently celebrated their 25th anniversary, having been placed in service early in 1901. Although the service has been exceptionally severe, they are still functioning successfully, the repairs during the entire period being limited to the installation of new CP-30 compressors, new trolley bases and lightning arresters. The original GE-55 motors and type L3 controllers are still giving good service. Records previous to 1910 are not available, but for the sixteen years since then, 1910 to 1925 inclusive, the accounts show a total of more than 15,500,000 tons of coal handled at a total maintenance cost of \$37,700 for the two locomotives. This is an average of approximately \$1,180 per locomotive per year over the entire period.



New Locomotive Which Joins Two Veterans of 25 Years' Service

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Copper Buying Is Active— No Trace of Panic Seen

Level-headed observers are practically agreed that nothing more serious than a possible temporary shortage of certain copper shapes confronts the copper industry at the present moment. During the past two weeks there has been a certain amount of scarehead agitation over the alleged possibility that prices would ascend to unwarranted heights as a result of serious shortages of stocks at the refineries. It is true that prices continue to increase in strength, but not to any extent which would justify the predictions made by certain of the trading gentry.

Readers of the *Wall Street Journal* were recently advised, in an article entitled "Copper Industry Faces Shortage," to contract for their requirements as far ahead as they can foresee them. The writer then continued with the statement that this policy would inevitably result in higher prices for the metal. *Engineering and Mining Journal*, in the issue for July 24, pointed out that any such stampede on the part of copper buyers would only result in hoisting the prices to a point from which it would have to take a severe tumble, with harm to all concerned with the copper industry. It then went on to state: "Consumption is going to increase steadily and production will be increased to meet it; that the price level of copper will improve moderately is not unlikely. It is to be hoped that this comes about in orderly fashion."

Present indications are that the tendencies toward a disastrous rise in prices have failed to develop into anything more tangible. Buying is active, but is based upon sound economic needs, rather than upon a panicky fear that the supply of raw material and of finished shapes is endangered.

Head of Westinghouse International Is Honored

A signal honor was accorded to Loyall A. Osborne, president of the Westinghouse Electric International Company, recently when he was elected chairman of the National Industrial Conference Board at the tenth annual meeting of that organization in New York City. In accepting this office Mr. Osborne assumed the chairmanship of the body whose members are the delegates of 27 national and state industrial organizations and four government departments, comprising more than 50,000 manufacturing concerns employing a total of more than 7,000,000 men and women. The board maintains a large staff of economists, statisticians and engineers who are continually investigating domestic and foreign problems of economic-industrial interest, and

since its organization in 1916 has issued 115 research and 45 special reports and many monographs on subjects of timely and practical interest. Mr. Osborne succeeds Frederick P. Fish, of Fish, Richardson & Neave, Boston, Mass., as chairman of the conference board.

Motor Transportation in Industry and Public Service Discussed

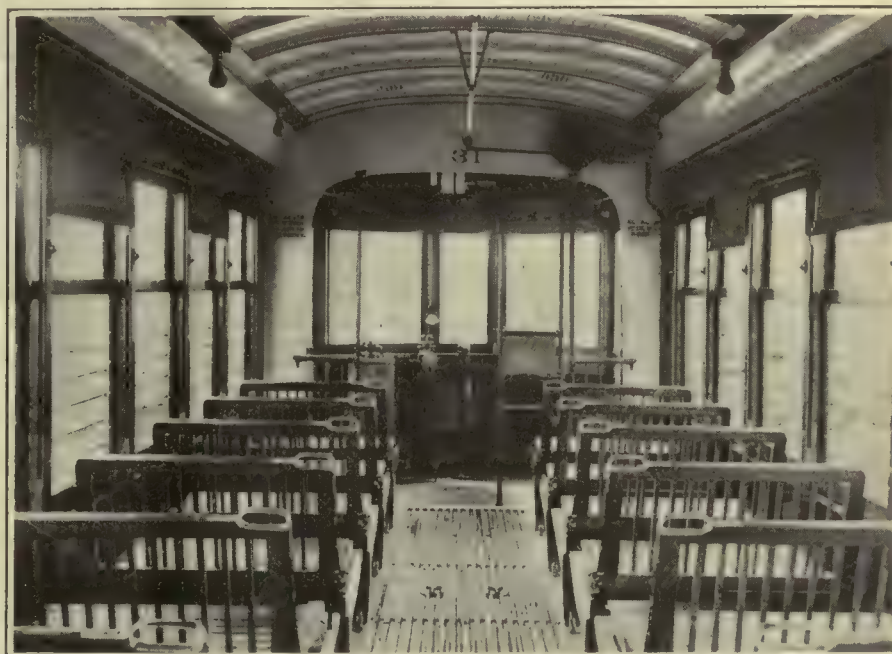
Statements by 23 prominent executives in various industries and in municipal governments are contained in the 1926 roll call number of the "Albatross," dealing with the use and importance of motor transportation in major fields of business, industry, and public service. Such men as T. F. Arkwright,

president Georgia Railway & Power Company; Edward Dana, general manager Boston Elevated; H. F. Fritch, president Boston & Maine Transportation Company; James J. Walker, Mayor of New York City, and Adrian Hughes, Jr., director of bus transportation United Railways & Electric Company, Baltimore, Md., are included in the list of contributors. The "Albatross" is the official news organ of the White Company, Cleveland, Ohio.

Thermit Patents Sustained

Decision was recently rendered by the United States District Court of New Jersey, Judge Bodine presiding, in the case of the Goldschmidt Thermit Company, a subsidiary of the Metal & Thermit Corporation of New York, versus the Alumino-Thermic Corporation of Roselle Park, N. J., Hugh G. Spilsbury and Henry J. Barnes, manufacturers of a material called "Feralite" for aluminothermic welding. The suit involved three patents covering essential features of aluminothermic welding. All three patents were sustained in the broadest terms and found to be infringed. The court has stated

Five Safety Cars for Mobile



Five light-weight safety cars have just been built for the Mobile Light & Railroad Company, Mobile, Ala., by the American Car Company, St. Louis, Mo. The cars are designed for double-end operation. Wood spindle backs are provided for the seats. Specifications follow:

Type of car.....Single-truck, double-end, one-man Birney Safety
Seating capacity.....33 passengers
Length over all.....29 ft. 9 in.
Truck wheelbase.....8 ft. 6 in.
Width over all.....8 ft. 3 in.
Height, rail to trolley base.....10 ft. 4 in.
Body.....All steel
Interior trim.....Natural Mexican mahogany
Headlining.....Carline finish
Roof.....Arch
Air brakes.....General Electric
Axles.....Brill
Bumpers.....Channel iron
Car signal system.....Faraday
Car trimmings.....Polished brass
Center and side bearings.....Brill
Compressors.....CP-27
Control.....K-63

Curtain fixtures.....Curtain Supply
Curtain material.....Pantasote
Destination signs.....Hunter Illuminated
Door operating mechanism.....American Car
Fare boxes.....Johnson type D.M.-4
Fenders.....H B wheelguards
Finish.....Pratt & Lambert Vitralite
Gears and pinions.....General Electric
Hand brakes.....American Car Co.'s standard
drop brake handle and staff
Headlights.....Ohio Brass "Imperial Gold Ray"
Journal bearings.....Plain
Journal boxes.....Brill
Lightning arresters.....General Electric
Motors.....Two GE-265, inside hung
Registers.....International R-5, double
acting, air operated
Safety devices.....Safety Car Devices Co.
Sanders.....Electric Service Supply Company
Sash fixtures.....O. M. Edwards Co.
Seats.....American Car Co. "Waylo"
Seating material.....Wood with spindle back
Springs.....Brill
Step treads.....Feralun
Trolley catchers.....Earl No. 10
Trolley base.....General Electric
Trolley wheels.....General Electric
Trucks.....Brill 79-E-2
Ventilators.....Brill exhaust type
Wheels.....Rolled steel, 26 in.

that a decree for an injunction and accounting may issue.

One of the patents sued on covers the aluminothermic mixture, or welding material; another covers the welding process involving preheating as a step, and the third covers the insert rail weld, whether having a loose insert or one made by cutting back the web and base. This latter practice is commonly known as "undercutting."

Advices from the Alumino-Thermic Corporation indicate that it may appeal the decision awarded by Judge Bodine. The course to be pursued will be determined following final decision by the court in the matter of the possible decree for an injunction and accounting.

General Electric Earnings for First Six Months of 1926

The General Electric Company's net sales billed for the first six months of the current year, ended June 30, 1926, totaled \$147,450,868 and the profit available for dividends on the common stock and surplus is \$19,000,392.

This announcement, which indicates net earnings equivalent to about \$2.63 per share on the 7,211,481 shares of new no par value stock, was made by President Gerard Swope in accordance with a new plan of the company for reporting earnings quarterly to the stockholders, in addition to the statement of orders received which has heretofore been sent stockholders every three months. The statement of earnings for the six months follows:

Net sales billed.....	\$147,450,868
Less: Cost of sales billed, including operating, maintenance and depreciation costs, reserves and provisions for all taxes	131,191,461
Net income from sales.....	16,259,407
Sundry income less interest paid and sundry charges.....	3,811,516
Profit available for dividends..	20,070,923
Less cash dividends on special stock	1,070,531
Profit available for dividends on common stock and surplus	19,000,392

Railway Men Get Insight Into Fire-Fighting Problems

More than 100 members of the Railway Fire Protection Association and others interested in fire protection were entertained at a practical demonstration given in Utica, N. Y., recently by the Foamite-Childs Corporation of that city. From the first simple demonstration until the final intricate one the interest of spectators was maintained at a high point. All tests were arranged with the principal idea of showing the best ways to fight typical railway and oil fires. In addition to the steam railroad men present, a number of electric railway representatives were on hand to witness the demonstration, as the problem of adequate fire protection on the two types of properties have many points in common.

A particularly convincing experiment was that dealing with fighting a fire in a box car. An especially constructed box-like structure was filled with open paint cans, over which gasoline was poured. The "car" was then touched off and allowed to burn furiously for some minutes before a Foamite port-

able machine was directed against it. The effect was immediately apparent and in a few seconds the blaze was completely extinguished.

Others of the demonstrations included methods of fighting acetylene gas combustion fire, hot tar flashes, fighting fire at 40 deg. below zero with the "All Weather" 2½-gal. extinguisher, automatic methods of extinguishing dangerous fires in oil tanks, and utilizing water lines in connection with the new Firefoam powdered chemical to extinguish certain types of large oil fires where other forms of foam equipment could not be readily employed.

A number of interesting discussions on the subject of fire fighting were given by various officials of the Foamite-Childs Corporation. W. J. Childs, president of the corporation, welcomed the guests in the morning and outlined the purpose of the sessions. A complete inspection of the Foamite-Childs plant was also made while the railway men were in Utica.

Rolling Stock

Interstate Street Railway, Attleboro, Mass., has ordered two light-weight, double-truck cars from the Wason Manufacturing Company, Springfield, Mass. These cars will be suitable for either interurban or city operation and are adapted to both one-man and two-man operation. They will possess many unique features of design and will constitute the last word in modern equipment.

San Francisco, Cal.—City Engineer M. M. O'Shaughnessy has received a request from Timothy A. Reardon, president of the Board of Public Works, for the purchase of six buses at a cost of \$54,000, to be operated on the Embarcadero. Mr. Reardon declares that the buses are proprietary articles and can be purchased without bids. Delay in purchase of the buses and operation of the line has caused much criticism to be directed at the Board of Public Works.

Trade Notes

Victor Oxy-Acetylene Equipment Company, manufacturer of cutting and welding equipment, has opened an Eastern factory branch and distribution center at 418-420 South Fourth

Street, St. Louis, Mo., with A. W. Henry in charge as manager. St. Louis was selected as the most advantageous point to serve the territory between the Rocky Mountains and the Atlantic Coast. The company's main plant and general offices are in San Francisco, and it has been in business fifteen years. A distinct feature of its equipment is that city gas can be used for the cutting torches.

J. M. Mahoney has recently become associated with the American Brown Boveri Electric Corporation, New York, N. Y. He has been active for more than 30 years in railway and control work and is the holder of many important patents dating from 1900 relating to apparatus for railway braking, railway control, fuse, switch and circuit breaker equipment. He has had both operating and manufacturing experience along the above lines and has been active in the work of the Standards Committee of the American Institute of Electrical Engineers, with particular reference to switch and circuit breaker standards. Mr. Mahoney has read papers before the American Institute of Electrical Engineers, National Electric Light Association, Association of Iron and Steel Electrical Engineers, and other technical societies. He is a member of many technical societies and has made many contributions to the technical press from time to time.

New Advertising Literature

Dunn Painting Machine Company, San Francisco, Cal., has issued new descriptive matter covering several important improvements to the Dunn painting machine and it will be pleased to mail copies to any railways interested in painting machine work.

Morse Twist Drill & Machine Company, New Bedford, Mass., has issued a circular describing the features of spiral fluted expansion reamer No. 717, which has just been placed on the market. This tool has been developed as an improvement upon the straight fluted type which was formerly Morse standard. It is especially adapted for reaming piston pin holes and is easily adjustable to a few thousandths oversize.

Ohmer Fare Register Company, Dayton, Ohio, has published another pamphlet in its series of historical addresses on method of fare collection. The latest addition is a reprint of an address delivered by John F. Ohmer before the Central Electric Railway Association at Toledo, May 26, 1908, entitled "Tickets as a Fare Medium for Street and Interurban Railway Traffic." At the time this address was presented, the method of collecting fares on interurban railways varied greatly, and some methods were very crude. The talk by Mr. Ohmer emphasized the need, both for the company and the conductor, of making a definite record for each value collected by the conductor for the company. This plan, he said, would mean that the work of fare collection could be carried out in a businesslike way, equally fair to the conductor and to the employer, thus removing causes for suspicion.

Metal, Coal and Material Prices

Metals—New York		July 27, 1926
Copper, electrolytic, cents per lb.....		14.375
Copper wire, cents per lb.....		16.00
Lead, cents per lb.....		8.775
Zinc, cents per lb.....		7.85
Tin, Straits, cents per lb.....		63.75
Bituminous Coal f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....		\$4.625
Somerset mine run, Boston, net tons.....		1.875
Pittsburgh mine run, Pittsburgh, net tons		1.75
Franklin, Ill., screenings, Chicago, net tons		1.825
Central, Ill., screenings, Chicago, net tons..		1.50
Kansas screenings, Kansas City, net tons		2.50
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....		\$6.25
Weatherproof wire base, N. Y., cents per lb		18.00
Cement, Chicago net prices, without bags		2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.		12.6
White lead in oil (100-lb. keg), N. Y., cents per lb.....		15.50
Turpentine (bbl. lots), N. Y., per gal.....		\$0.94

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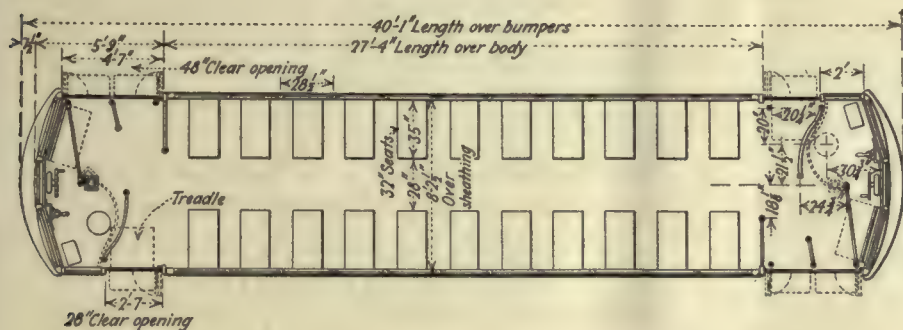
Fifteen double-truck, double-end safety cars were recently put in service by the Virginia Railway & Power Company.

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Pittsburgh, Electrical Engineering & Mfg. Co., 909 Penn Ave.

Cincinnati, Electrical Engineering & Mfg. Co., 607 Mercantile Library Building.

Cleveland, Electrical Engineering & Mfg. Co., 422 Union Building.

Baltimore, O. T. Hall, Sales Engineer, 437-A Equitable Building.

Revere, Mass., J. F. Drummey, 75 Pleasant Street.

Los Angeles, Special Service Sales Co., 502 Delta Building.

San Francisco, Special Service Sales Co., 222 Underwood Building, 545 Market Street.

Toronto, Can., Railway & Power Engineering Corp., Ltd., 101 Eastern Ave.

Montreal, Can., Railway & Power Engineering Corp., Ltd., 326 Craig St., West

Winnipeg, Can., Railway & Power Engineering Corp., Ltd., P. O. Box 325.

NEW ISSUE

\$5,000,000

Dallas Railway & Terminal Company

(Name at present Dallas Railway Company)

First Mortgage Gold Bonds, 6% Series due 1951

Dated July 1, 1926

Due July 1, 1951

Interest payable January 1 and July 1 without deduction for the Federal Income Tax up to but not exceeding 2% per annum. Pennsylvania 4 mills Tax refunded on timely application. Principal and interest payable at the office or the agency of the Company in New York and in Boston. Coupon bonds in denominations of \$1,000, \$500, and \$100, registerable as to principal. Redeemable in whole or in part at any time on 30 days' notice before July 1, 1930, at 106 and interest, and at a premium decreasing 1% each four year period thereafter, the bonds being redeemable at 100% on and after July 1, 1950. Old Colony Trust Company, Trustee.

The following is summarized from a letter written by Mr. A. S. Grenier, Vice-President:

The Company operates, under a modern franchise, the entire electric railway service in the City of Dallas, Texas, serving a population estimated at about 250,000. The Company also owns and operates a modern eight-story terminal station and office building near the center of the business district of the City. In addition the Company operates under lease the electric railway serving that part of Dallas known as Oak Cliff.

EARNINGS: The earnings of the Company for the four years ended December 31, 1925, as certified by Messrs. Haskins & Sells, independent auditors, were as follows.

Year	Gross Earnings	Operating Expenses, Including Maintenance, Taxes and Rentals	Net Earnings
1922	\$3,270,827	\$2,532,958	\$737,869
1923	3,330,425	2,632,349	698,076
1924	3,322,215	2,547,246	774,969
1925	3,429,298	2,578,079	851,219

Annual interest requirements of this issue..... 300,000

Net earnings for the year 1925 as shown above, were 2.83 times the annual interest requirements of these Bonds.

Dividends have been paid on the Company's Preferred Stock since 1921. During the year 1925, cash dividends paid on the Company's Common Stock then outstanding amounted to \$7.24 a share, and cash dividends have been paid each year since 1921 in at least an equal amount on the Common Stock.

SECURITY: These Bonds will be secured, in the opinion of counsel, by a direct first mortgage on all the Company's property and equipment, including the terminal building. The principal amount of these \$5,000,000 Bonds to be issued is less than 60% of the value of the Company's wholly owned property as of May 31, 1926, as established under the franchise for rate-making purposes. This property has been recently appraised by independent engineers at depreciated values largely in excess of the franchise value.

FRANCHISE: Under the terms of the Company's franchise, approved by popular vote in 1917, a definite property valuation has been established on which the Company is entitled to earn a return of 7% after provision for maintenance, depreciation, accident and surplus reserves. The Company has since 1920 been granted such fare rates as have been necessary to permit the allowed 7% return under the franchise.

EQUITY: On completion of the present financing, these Bonds will be followed by \$1,500,000 7% Preferred Stock and \$3,250,000 Common Stock of the Company, more than 92% of which Common Stock will be owned by the Electric Power & Light Corporation.

SUPERVISION: More than 92% of the Common Stock of the Company will be owned by the Electric Power & Light Corporation. The Electric Bond and Share Company will continue to be identified in a supervisory capacity (under the direction and control of the Board of Directors of the Company) with the operations of the Company.

We offer the above Bonds, when, as, and if issued and received by us, subject to approval of counsel, Messrs. Simpson, Thacher & Bartlett.

Price 96 $\frac{1}{2}$ and interest to yield over 6.25%

Tucker, Anthony & Co.
Old Colony Corporation

Halsey, Stuart & Co.
INCORPORATED
W. C. Langley & Co.

The information contained in this advertisement is not guaranteed by us, but having obtained it from reliable sources, we believe it to be correct.

Light on the Bus Braking Question

The ABC's of Bus Brakes and Braking Systems

Metal to metal or molded liners?

The ideal liner, if such a thing were possible, would give: First, constant coefficient of friction, i.e. coefficient of friction in one liner would be exactly like that of every other liner and would give exactly the same braking effect; second, it would be non-abrasive; third, it would have extremely long life.

In general terms, this combination would necessitate the use of a dense material impervious to oil and water, yet soft enough to avoid drum wear.

Cast iron liners are reasonably impervious to water and oil, they give reasonably long life, and help in dissipating heat. On the other hand, they necessitate heavier construction, increasing unsprung weight, and their low coefficient of friction makes enormous power necessary for their application. In addition, they have a tendency toward "grabbing" which makes smooth control difficult. This is not so noticeable when they are cool, but the tremendous pressure necessary for their application makes them heat rapidly and "grab."

Conventional fibre liners, as a rule, although their coefficients of friction may be fairly high, are adversely affected by water, oil and heat and heretofore they have rarely maintained even an approximately constant coefficient of friction. On the other hand, fibre liners give much smoother and more comfortable stops, far superior to metal in this respect. Then, too, the fibre and molded liner manufacturers are constantly improving their products, one heavy

fibre liner of recent development indicating a life equal to or closely approaching metal.

This particular liner (and others that equal it will probably follow) seems to possess the compromise features which come nearest giving an ideal brake. It has a satisfactorily constant coefficient of friction, high enough to operate without too great pressure; it is dense enough to resist the effect of oil and water; it resists heat well; it is hard and tough enough to wear exceptionally well, giving a life that compares very favorably with metal; and it is smooth, never "grabby," in operation. Used in combination with a high-carbon drum of correct design this hard fibre liner makes possible a worthwhile reduction in brake upkeep while giving smooth, dependable braking effect.

An abrasive or grabby liner is not desirable in operation as it is erratic and uncomfortable, even dangerous. It is our belief now that the newer heavy duty fibre and molded liners are superior to iron for all-around satisfactory brakes.

This is the fifth of an informative series on Bus brakes. The series consists of:

- A—What Brakes Must Do.
- B—How many wheels should brakes go on?
- C—Self-equalization and brake adjustments.
- D—Curing the skid.
- E—Metal to metal or molded linings—which?
- F—Braking Power.
- G—Compressor Mountings and Drives.
- H—Compressor Cooling.
- I—The Control Valve.
- J—Maintenance on Different Types.

The above topics will appear in the above order. Address any comments, suggestions, or requests for advance information to—

The Christensen Air Brake Company
6513 Cedar Avenue, Cleveland, Ohio

Christensen



A 25-passenger bus equipped with the Baker-Raulang Luggage Loft carries 30 paying passengers, with no increase in wheel-base.

35 Square Feet of Expense or Thirty Five Square Feet of Revenue



Luggage has always been the necessary evil of bus operation. Now that's settled to the complete satisfaction of operator and passenger alike by the Baker-Raulang Luggage Loft.

THERE are actual, provable, money-in-the-bank advantages to the operator in new Baker-Raulang Bus Body design. For one—35 square feet of your bus floor is changed from expensive luggage-carrying space into profitable passenger-carrying space, by the exclusive Baker-Raulang Luggage Loft.

Above each passenger is a roomy compartment where suit-cases, bags, hat boxes can be carried, out of the way. Floor space formerly required for baggage is used for revenue-paying seats, and in addition the bus operator is relieved of all time and liability in caring for passengers' baggage, and passengers have their parcels easily available at any time on the journey.

The Luggage Loft allows ample room for inside storage yet leaves the aisle clear.

The convenient guide rail increases the comfort of passengers going to and from seats, and making possible the carrying of standees where regulations permit.

The Luggage Loft is only one of many Baker-Raulang improvements in bus body design—improvements that make good our promise to the industry—to promote public popularity. The new features are the result of long and careful study of the needs of the industry on the part of this veteran organization which for 73 years has been designing and building fine closed bodies for carriages, for the first closed automobiles, and now for buses.

We will gladly explain Baker-Raulang advantages to interested buyers, and apply our experience, study and facilities to the solution of your engineering and operating problems.

Bus Body Division, THE BAKER-RAULANG COMPANY, Cleveland, Ohio, U. S. A.

**Baker
Raulang**
BUS
BODIES

TRADE MARK



No. 7 of Inter Cities Coach Co. fleet, Dayton, Ohio

INTERNATIONAL HARVESTER MOTOR COACHES

*Are the Product of Tremendous Resources
and of 22 Years' Automotive Experience*

Manufacturers for nearly a century, motor truck builders for over twenty years, the International Harvester Company pioneered also in the designing of motor coaches. The earliest of its 6-cylinder conveyances are in highly profitable operation after six-figure mileage records, and the perfected chassis coming from the factories today are equipped in every detail to render utmost satisfaction to coach owners and drivers and—more important—to discriminating passengers. Mechanical excellence, beauty of line, and de luxe

appointments catering to the rider's comfort, have built a consistent high reputation for International Motor Coaches. The various bodies supplied for the 6-cylinder chassis carry 24 to 33 passengers. Regular equipment includes air brakes on all four wheels and every appointment detail known to highest-grade manufacture. The International SL 4-cylinder coach [12 to 14 passengers] offers advantages of flexibility and economy, either as main units or as auxiliaries to larger operating units.

Detail information on International Coaches—or trucks and industrial tractors—will be mailed on request

INTERNATIONAL HARVESTER COMPANY

606 So. Michigan Ave. of America
(Incorporated)

Chicago, Illinois

International Motor Trucks

A full line ranging from the $\frac{3}{4}$ -ton "Special Delivery" and 1-ton and $1\frac{1}{2}$ -ton Speed Trucks to the 5-ton Heavy-Duty Truck.

McCormick-Deering Industrial Tractors

Compact, flexible power units, ideal for many trailer-hauling jobs and for work around yards, plants, etc. Disk wheels, rubber tires, spring-mounted front axle, and 2, 4, and 10 m. p. h. forward speeds.

International Harvester offers you unparalleled automotive service, rendered through the world's largest Company-owned truck and coach service organization. Company-owned branches are now located at 120 points in the United States and 17 in Canada, and they are supplemented by the service of International automotive dealers.



*Nothing takes the
place of leather*

"and people inquire daily—"



"Where is the car with the comfortable seats?"

Read that statement again! It is not hard to get people to ride in cars when they are enthusiastic about the seats.

It was a pleasant shock to the officials of this company to hear the riding public clamor for this particular car that they were trying out.

Real leather seats invite the public to ride and lower your cost-per-mile maintenance.

We offer you complete hides or will cut them to your pattern, if you submit paper templets. Send for samples.

Hyaline Grains
Hand Buffs
Machine Buffs
Special Machine Buffs

Cleveland
Dennison Ave. and
Jennings Road

Western Representatives
Midgeley & Borrowdale
McCormick Bldg., Chicago



Tanning Company
Cleveland, Ohio

Eastern Representatives
L. D. Bockwell Co.
Nat'l City Bldg., N. Y. C.

HYALINE

The Finest Coach Leather Obtainable



Where only the hardy survive

Among some tribes in Africa part of their religious ritual is to dance constantly for long periods of time. Only the most hardy can survive such a gruelling test of endurance.

On many electric railways they put cars out on the road for long periods. Only the best of car equipment can stand such service. Which is the reason why so many roads specify Boyerized Parts. The Boyerizing Process produces a surface that enables them to outlast ordinary steel parts three to four times—an important consideration when figuring maintenance costs.

Select the parts you need and ask for quotations.

Brake Pins	Spring Post Bushings
Brake Hangers	Spring Posts
Brake Levers	Bolster and Transom Chafing Plates
Pedestal Gibs	Manganese Brake Heads
Brake Fulcrums	Manganese Truck Parts
Center Bearings	Bushings
Side Bearings	Bronze Bearings

Bemis Car Truck Company

Electric Railway Supplies

Springfield, Mass.

Representatives:

Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.
 F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
 W. F. McKenney, 54 First Street, Portland, Ore.
 L. H. Denton, 1328 Broadway, New York City, N. Y.
 A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.

The
McArthur
Turnbuckle



"It effectively



WILLIAM T. JACKSON, *Director of Public Service for the city of Toledo. Mr. Jackson is well known for his active interest in behalf of city betterment, and he is now serving as President of the Ohio State Conference on City Planning. And as President and General Manager of Joseph Jackson & Son, one of Toledo's oldest and best known firms of general contractors, he has had a very direct part in the upbuilding of the city. He is also first Vice President of the Toledo Chamber of Commerce.*

protects the pavement"

"FOR some time we have been working on the problem of how to prevent rapid deterioration of pavement in track zones—and I believe we now have the solution." This statement was made recently by William T. Jackson, Director of Public Service for the city of Toledo. In Toledo, the city rather than the traction company handles the paving of track areas.

"We use granite block pavement in the track area, but we have found that it is practically impossible to fit the blocks tightly against the web of the rail. As a result, water and frost enter, and failure of the pavement follows. The flange of the wheel also frequently breaks off the block, or knocks the block out of place, causing it to pitch toward the rail.

"To overcome this condition, we have installed an asphaltic rail filler each side of the rail. This forms a water-tight bond with both rail and pavement, and keeps the granite blocks away from the flange of the wheels. We find it effectively protects the pavement and makes a neat looking job. We are, in fact, so well pleased with the result that we plan to follow this practice in our future paving work."

Carey Elastite System of Track Insulation was the material used to effect the improvement in pavement construction described by Mr. Jackson. Traction engineers all over the country today are advocating the use of the Carey system because it effectively protects the pavement and lowers maintenance costs. Noticeable reduction of noise also results where this resilient material is used to cushion the rails.

Write today for full particulars.

CAREY Elastite System of Track Insulation consists of a fibrous asphaltic compound, made in pre-formed slabs to fit any rail. It is easily cut, fitted, and driven into place with a sledge. Unaffected by moisture and temperature changes, and will outlive the track itself.

THE PHILIP CAREY COMPANY

Lockland, Cincinnati, Ohio

Carey Elastite
TRADE MARK REG. U.S. PATENT OFFICE



**SYSTEM OF
TRACK INSULATION**



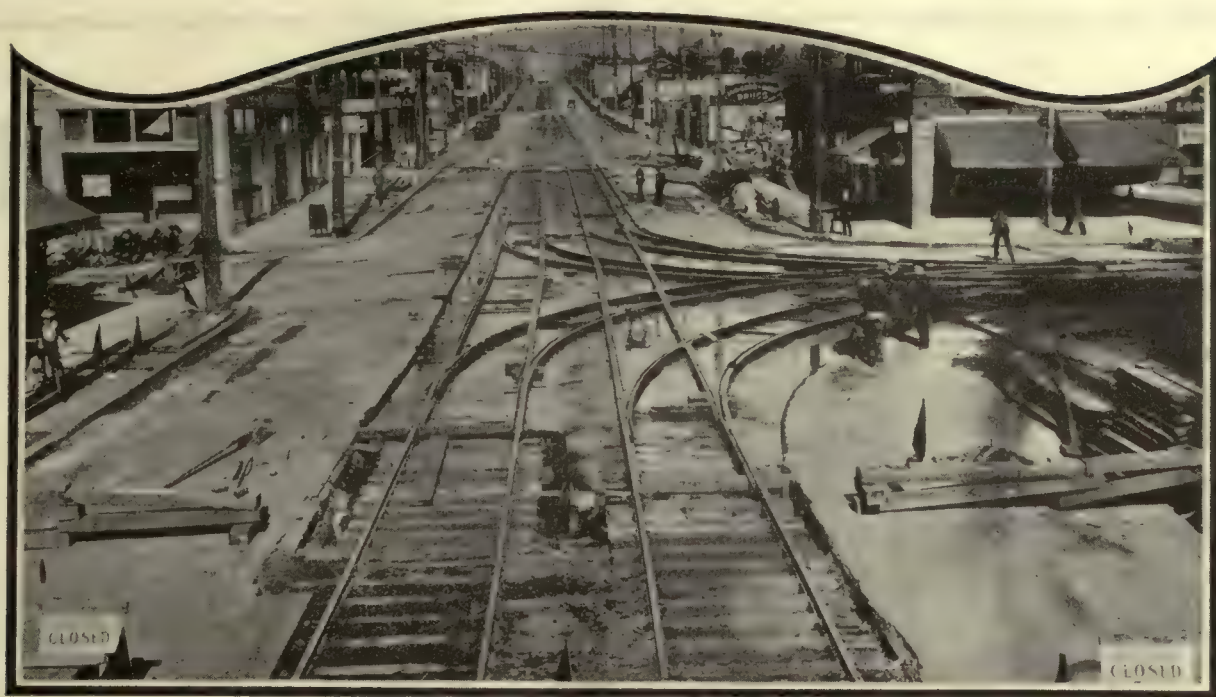
*For the modern car—a truly
modern current collector
with five specific points of
superiority*

1. LESS WIRE WEAR, because less trolley tension is needed for absolutely safe operation. Full 3-inch contact surface of Miller Trolley Shoes "hugs" the wire as no wheel ever could. This in itself is vitally important with increased operating speeds.
2. LESS SHOE WEAR, because Miller Trolley Shoes have no bearings to wear out and few moving parts.
3. NO LUBRICATION, because there are no rotating parts to Miller Trolley Shoes. Unnecessary work and "shopping" time is thus eliminated.
4. NO ARCING. Arcing is a devastating waste. It is eliminated only with sliding contact.
5. AMPLE CURRENT CAPACITY, even for the fastest and heaviest modern cars, saves motors, ensures steady lighting.

Make a trial under your own operating conditions.

We will gladly co-operate.

Miller Trolley Shoe Company
295 Columbia Road, Boston 21, Mass.



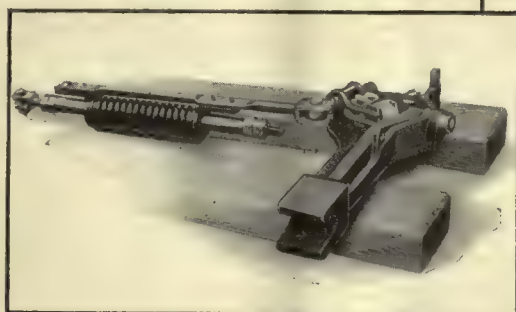
Bethlehem Track Specialties *for Electric Railways*

Special Trackwork; Tee and Girder Rails; Special Splice Bars for Welding; Machine Fitted Joints; Abbott and Center Rib Base Plates; Tie Rods; Bolts; Pole Line Material; Rolled Steel Wheels and Forged Axles.

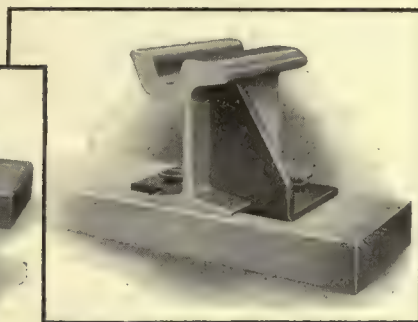
Catalog Sent on Request

Special Trackwork and Layouts

Switch Stand, Model 1222



Switch Stand, Model 51-B



Brace Tie Plate
Design 804

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

DISTRICT OFFICES:

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Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

BETHLEHEM

Big—Bigger—Biggest!

Last year's convention was *big!*

This year's will be *bigger!*

In fact actual Exhibitors' space reservations already made indicate that it will be the *biggest* Convention of the American Electric Railway Association.

It all means more interest, more optimism—and *more buying* by the electric railway companies.

*and to get the biggest benefits from the
Annual A. E. R. A. Convention — use*

ELECTRIC RAILWAY JOURNAL'S *Complete Convention Service*

New attractions for the reader—and new opportunities for the advertiser. A service which will afford the only effective and permanent meeting place for buyer and seller. It will enable you to put *your* message before the entire railway field, the stay-at-homes as well as the Delegates, before, during and after the Convention. This *is* complete service.

Advertising rates on request.

Annual Convention Number dated September 25

A complete volume on the theme of "Modern Cars Pay," written by recognized authorities. The big opportunity to ally your products with the thinking of the industry in the biggest single sales factor in the electric railway industry.

Three Daily Convention Issues dated October 5, 6, 7

The only way to reach every delegate at the Convention. Distributed on three mornings at the breakfast table and at the pier.

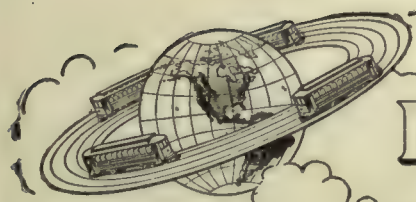
Annual Convention Report Number dated October 9

The first and only complete report of papers, proceedings and discussion—mailed 24 hours after the close of the convention.

Electric Railway Journal, Tenth Ave. at 36th St., New York City

Member A.B.C., A.B.P., A.E.R.A.

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.

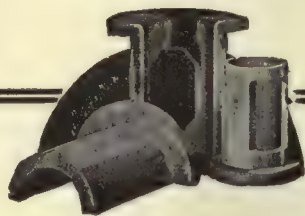


Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

Greater Service Per Dollar Invested



"Tiger" Bronze Axle and Armature Bearings

More-Jones "Tiger" Bronze castings for axle and armature-bearing service was one of our early achievements. This is probably the most widely known bronze on the market. It has stood the test of time. There is nothing better for long, efficient and most economical results. Let us quote you.

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES QUALITY PRODUCTS

You're having brush trouble

CORRECT IT
USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron

Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.

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Griffin Wheel Company

410 North Michigan Ave.
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GRIFFIN F. C. S. WHEELS

For Street and Interurban Railways

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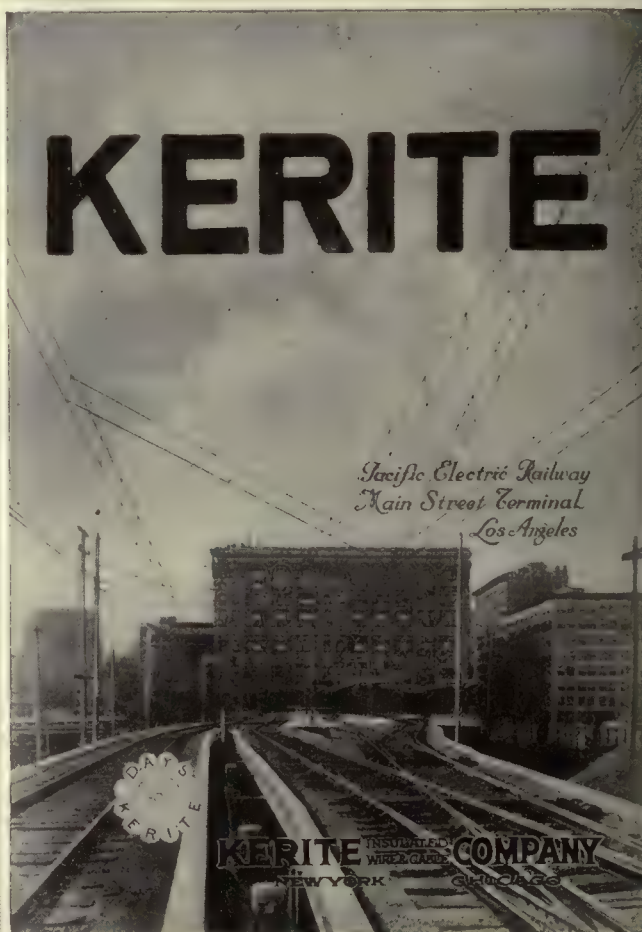
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*Pacific Electric Railway
Main Street Terminal
Los Angeles*



What Nuttall BP Gears can do for you!



Nuttall Helical
Gear Set

They will wear Four Times as long

BP Gears are nearly four times as hard as untreated gears. An untreated gear of 40 carbon steel is 140 Brinell. The BP treatment raises the hardness from 140 to 500 Brinell. Naturally this increased hardness means that BP gears will wear longer in service.

R.D. NUTTALL COMPANY
PITTSBURGH  PENNSYLVANIA



All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

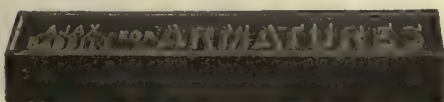


Cold Dinners
for *your* passengers?

Not if you use

AJAX
BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company
Established 1880
PHILADELPHIA

NEW YORK CHICAGO BOSTON CLEVELAND

PANTASOTE

Trade Mark

Seat and Curtain Materials

There is no substitute for Pantasote

AGASOTE

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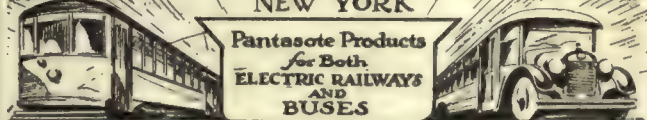
Roofing—Headlining—Wainscoting

The only homogeneous panel board

standard
for electric railway cars
and motor buses

The PANTASOTE COMPANY Inc.

At 46th 250 Park Avenue Street
NEW YORK



Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago
New York

Boston
Cleveland

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Denver

San Francisco

U. S. Steel Products Co.
Los Angeles

Portland

Seattle



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.

Cleveland, Ohio

Chicago Representatives: Jameson-Ross Company,
Straus Bldg.

FARE BOXES for BUSES

Let us tell you of this especially designed box for this class of service.



The Cleveland Fare Box Co.

4900 Lexington Ave., Cleveland, O.

Canadian Cleveland Fare Box Co., Ltd.
Preston, Ontario

COIN COUNTING And Sorting Machines CHANGES CARRIERS Tokens



Type R-11
Double Register

International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

The International Register Co.

15 South Throop Street, Chicago, Illinois

Instantaneous Registration by the Passenger

ROOKE of fare collection— SYSTEM

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register portable or stationary, at option. Handles nickels, dimes, quarters, or metal tickets, in any combination, FLEXIBILITY with CERTAINTY.



Roke Automatic Register Company Providence, R. I.

Railway Equipment

Car Ventilators

Bus Ventilators

Air Sanders

Mechanical Sanders

Indicating Signals

Universal Lanterns

Classification Lanterns

Selector Switches

Fare Box Lights

Water Tanks

THE NICHOLS-LINTERN CO.

7960 LORAIN AVENUE

CLEVELAND, OHIO

Surplus Stocks Are Easily Disposed of Through the

"SEARCHLIGHT" SECTION

"FOR SALE" announcements are carefully read by the trade.

"SEARCHLIGHT" Ads bring prompt and profitable returns.

Displayed—\$5.00 or less an inch per insertion.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
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DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building



WORKS
Bayonne, N. J.
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Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893

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NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, Porto Rico, Royal Bank Building

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National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

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Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

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Tool Steel Gears and Pinions	Ft. Pitt Spring & Mfg. Co., Springs
Anglo-American Varnish Co., Varnishes, Enamels, etc.	Flaxlinum Insulation
National Hand Holds	Anderson Slack Adjusters
Genesco Paint Oils	Economy Electric Devices Co., Power Saving and Inspection Meters
Dunham Hopper Door Device	Yellow Coach Mfg. Company— Single and Double-deck Buses
Garland Ventilators	
Walter Tractor Snow Plows	Feasible Drop Brake Staffs

'CARNEGIE'

for
WHEELS
AXLES
RAILS
CROSS TIES



Carnegie Steel Company
PITTSBURGH, PENNA.

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta Chicago Cleveland New York
Philadelphia Pittsburgh Dallas

Pacific Coast Representative:

United States Steel Products Company
Portland San Francisco Seattle

Export Representative:

United States Steel Products Company, New York, N. Y.

Tisco Manganese Steel in trackwork,
introduced by Wharton in 1894, is
still the superior metal for long life
under severest railway service.

WILLIAM WHARTON JR. & CO., Inc.

Easton, Penna.

SPECIALISTS

in the

Design and Manufacture
of

*Standard—Insulated—and
Compromise Rail Joints*

The Rail Joint Company
165 Broadway, New York City

The DIFFERENTIAL CAR



Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

"The Standard for Rubber Insulation"

INSULATED WIRES and CABLES

"Okonite," "Manson," and Dundee "A" "B" Tapes

Send for Handbook

The Okonite Company

The Okonite-Callender Cable Company, Inc.

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Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
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Pettingell-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

Gen. Rep.: Engineering Materials Limited, Montreal.

Canadian Rep.: Victor G. Mendoza Co., Havana.



ELRECO TUBULAR POLES



THE "WIRE LOCK"

THE CRANKED JOINT

COMBINE

Lowest Cost

Least Maintenance

Lightest Weight

Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

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PITTSBURGH • OAKLAND, CAL. • CHICAGO



*{ The Hardware makes the line
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"IRVINGTON"

Black and Yellow

Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.

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Sales Representatives in the Principal Cities

Waterproofed Trolley Cord



Is the finest cord that science and skill can produce.
Its wearing qualities are unsurpassed.

FOR POSITIVE SATISFACTION ORDER
SILVER LAKE

If you are not familiar with the quality you will be
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Sold by Net Weights and Full Lengths

SILVER LAKE COMPANY

Manufacturers of bell, signal and other cords.

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AND CABLE

PAPER INSULATED
UNDERGROUND CABLE

MAGNET WIRE

AMERICAN ELECTRICAL WORKS

PHILLIPSDALE, R. I.

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ANACONDA COPPER MINING COMPANY
THE AMERICAN BRASS COMPANY

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NEW YORK

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Chapman
Automatic Signals
Charles N. Wood Co., Boston



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FOR

ELECTRIC RAILWAYS

HIGHWAY CROSSING SIGNALS



SAMSON SPOT WATERPROOFED TROLLEY CORD



Trade Mark Reg. U. S. Pat. Off.

Made of extra quality stock firmly braided and smoothly finished.
Carefully inspected and guaranteed free from flaws.
Samples and information gladly sent.

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USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.
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Proposals, 40 cents a line an insertion.

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Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.
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An advertising inch is measured vertically on one column, 3 columns—30 inches—40 a page.

E R J

OFFICIAL PROPOSALS

Bids: Aug. 27.

Steel Passenger Cars and Car Trucks

BROAD STREET SUBWAY
Contract No. 135

Philadelphia, Pa.
DEPARTMENT OF CITY TRANSIT,
CITY OF PHILADELPHIA, 11th Floor,
1211 Chestnut Street, Philadelphia, July 17, 1926.

Sealed proposals, addressed to the undersigned at the office above mentioned, will be received until 11 o'clock a.m. (Eastern Standard Time), on Friday August 27, 1926, and publicly opened immediately thereafter, for constructing and delivering to the City 150 Steel Passenger Cars and 10 extra car trucks.

Plans and specifications may be seen at the office of the Department, on the twelfth floor, 1211 Chestnut Street, and copies of same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of fifty (50) dollars will be required for the plans and specifications. This deposit will be refunded upon return of the plans and specifications in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accom-

panied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia to the amount of five (5) per centum of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

H. E. EHLERS, Director.

POSITIONS VACANT

YOUNG man for superintendent of 14 mile trolley line in tropical city, of 75,000 people. Healthful climate. Give with first letter full statement of experience, salaries past and expected, references, age and personal habits. P-920, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

SUPERINTENDENT with twenty years' experience in operation and maintenance of railway rolling stock and track; an outstanding success as a railway operator and as operator of co-ordinated railway and bus services desires for personal reason to make change. Fully capable of taking complete charge as manager or superintendent. PW-917, Electric Railway Journal, 7 South Dearborn St., Chicago, Ill.

FOR SALE

Machine Wheel Lathe

No. 13535. Maximum swing of this machine 49-in., maximum length of axle 9-ft., made by the Niles-Bement-Pond Co., Niles Tool Works, Canton, Ohio.

C. W. LEPPER

General Purchasing Agent
435 Sixth Ave., Pittsburgh, Pa.
Attention Mr. Josiah Poole

FOR SALE

14 BIRNEY SAFETY CARS

Brill Built

West. 508 or G.E. 264 Motors
Cars Complete—Low Price—Fine Condition
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

ELECTRIC RAILWAY EQUIPMENT!

Railway Motors

25—Westinghouse 307's
G.E. 80's.

Birney Cars

4—32 seating capacity Westinghouse 508A motors. Fully equipped. Splendid condition.

Tower Truck

1—2½-3 ton White. Three section. Fully equipped. New 1923.

Southern Cars

6—Double truck. 42 passenger. One man operation.

Car Hoist

1—Universal. Columbia Mch. Co. make. Motor and control equipment included

Sweeper

1—Double truck Snow Sweeper. Fully equipped

Welding Machine

1—Railway Welding and Bonding Co. New 1923. Fully equipped.

Track Grinder

1—Atlas Rail Grinder new 1923. Excellent condition

When the operations of the

New York & Long Island Traction Co.

ceased,—all equipment was purchased by us for resale. This unusual opportunity was then created for railway companies to secure at unbelievable savings the little-used equipment shown here.

All is in excellent condition—and the low prices will surprise you. Write for complete information and prices on what you can use.

H. E. SALZBERG CO., Inc, 50 Church St., New York City

"Opportunity" Advertising:

Think "SEARCHLIGHT" First!

—to help you get
what you want

—to help you sell what
you no longer need

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Furnaces, Electric, Steel
Melting
American Brown Boveri
Elec. Corp.

Funnell Castings
Wm. Wharton, Jr. & Co.

Fuses and Fuse Boxes
Consolidated Car Heating Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.
Westinghouse E. & M. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.

Gauges, Oil and Water
Ohio Brass Co.

Gear Blanks
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.

Gear Cases
Chillingworth Mfg. Co.
Electric Service Supplies Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bemis Car Truck Co.
Bethlehem Steel Co.
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., E. D.

Generating Sets, Gas-Electric
General Electric Co.

Generators
American Brown Boveri
Elec. Corp.

Gongs (See Bells and Gongs)

Grasses (See Lubricants)

Grinders & Grinding Supplies
Metal & Thermite Corp.
Railway Trackwork Co.

Grinders, Portable
Railway Trackwork Co.

Grinders, Portable Electric
Railway Trackwork Co.

Grinding Bricks and Wheels
Railway Trackwork Co.

Guard Rail Clamps
Ramapo Ajax Corp.

Wm. Wharton, Jr. & Co.

Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Hammers, Pneumatic
Ingersoll-Rand Co.

Haps, Trolley
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.

Nuttall Co., E. D.
Star Brass Works

Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Headlining
Haskelite Mfg. Corp.
Pantastote Co., Inc.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

Holists, Portable
Ingersoll-Rand Co.

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Traction
Brake Co.

Industrial Tractors
International Harvester Co.

(Continued on page 42)

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Christensen Air Brake Co.
Westinghouse Air Brake Co.
Air Receivers & Aftercoolers
Ingersoll-Rand Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch
Stands
Ramapo Ajax Corp.

Automatic Safety Switch
Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.

Babbitt Metal
Ajax Metal Co.
Johnson & Co., J. R.
More-Jones Brass and Metal Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Bankers
Tucker, Anthony & Co.

Batteries, Dry
Nichols Lintern Co.

Bearings and Bearing Metals
Ajax Metal Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
More-Jones Brass and Metal Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller
Side
Stucki Co., A.

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Baker-Raulang Co., The
Cummings Car & Coach Co.

Bodies, Passenger Car
Baker-Raulang Co., The

Body Material, Haskelite and Plymet
Haskelite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Ry. Appliance Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co., Inc.
Westinghouse E. & M. Co.

Brushes, Graphite
Morganite Brush Co., Inc.
Westinghouse E. & M. Co.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Bulkheads
Haskelite Mfg. Corp.

Bus Seats
Hale-Kilburn Co.

Buses, Motor
Brill Co., The J. G.
Cummings Car & Coach Co.
International Harvester Co.
International Motor Co.
Mack Trucks, Inc.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.

Cables, (See Wires and Cables)

Cambrie Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

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Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.

Cars, Gas, Rail
Brill Co., The J. G.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

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Electric Equipment Co.

Cars, Self-Propelled
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General Electric Co.

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More-Jones Brass & Metal Co.

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American Steel Foundries
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Castings, Malleable and Brass
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Trolley
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Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
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Celling Car
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Ceiling, Plywood, Panels
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Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

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Wires and Cables
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Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
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Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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(See also Snow-Plows, Sweepers and Brooms)
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Ohio Brass Co.

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General Electric Co.

Coil Banding and Winding
Machines
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Colls, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Colls, Choke and Kicking
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General Electric Co.
Westinghouse E. & M. Co.

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International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

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Cleveland Fare Box Co.

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General Electric Co.
Westinghouse E. & M. Co.

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Westinghouse Tr. Br. Co.

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Westinghouse E. & M. Co.

Condenser Papers
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Westinghouse E. & M. Co.

Connectors, Trailer Car
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Elec. Corp.

General Electric Co.
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Controller Regulators
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Elec. Corp.

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Amer. Steel & Wire Co.
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Measuring, Testing and Recording
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American Steel & Wire Co.
Anaconda Copper Mining Co.

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Brill Co., The J. G.
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Ohio Brass Co.
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Baker-Raulang Co., The
Cranes, Hoists & Lifts
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International Steel Tie Co.

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Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
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Morton Mfg. Co.
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Wish-Service, P. Edward

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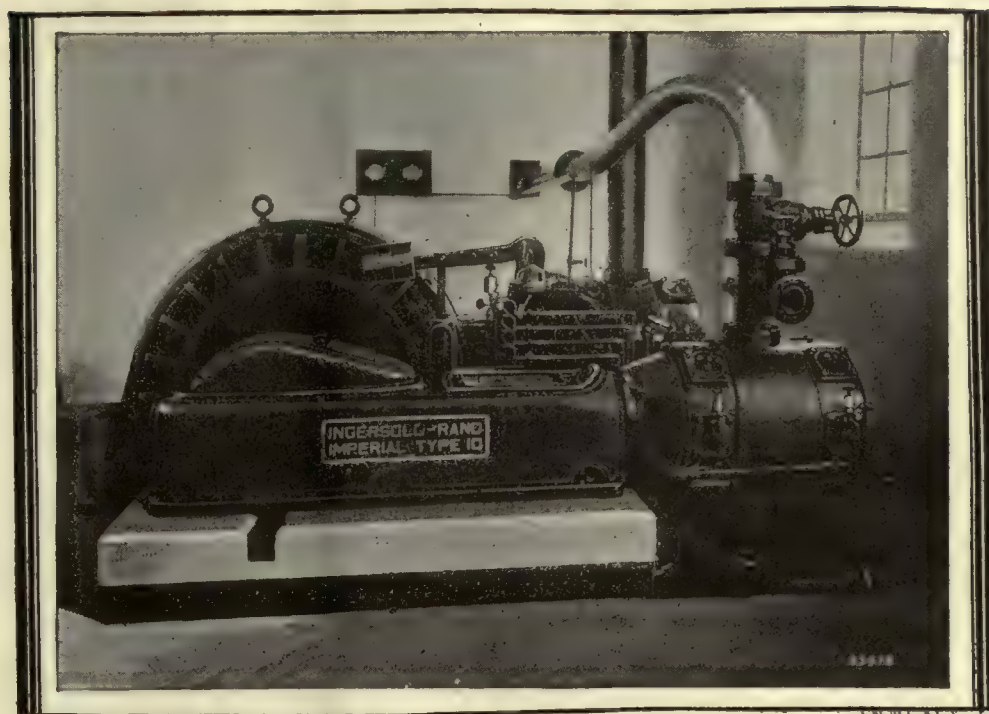
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- Jacks (See also Cranes, Hoists and Lifts)**
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- Oils (See Lubricants)**
- Omnibuses (See Buses, Motor)**
- Oxy-Acetylene (See Cutting Apparatus, Oxy-Acetylene)**
- Oxygen**
International Oxygen Co.
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Westinghouse Traction Brake Co.
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Electric Service Supplies Co.
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Naugle Pole & Tie Co.
- Poles, Trolley**
Bell Lumber Co.
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- Rail Joints—Welded**
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- Rail Welding**
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Our advertisement in the issue of July 17 showed how electric rail way men are demonstrating their confidence in

HASKELITE and PLYMETL

Another full page advertisement will appear in the issue of August 7.

HASKELITE MANUFACTURING CORPORATION

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A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.

Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the alphabetical index.



Car Heating and Ventilation

are two of the winter problems that you must settle without delay. We can show you how to take care of both, with one equipment. Now is the time to get your cars ready for next winter. Write for details.

The Peter Smith Heater Company
6209 Hamilton Ave., Detroit, Mich.



INDUSTRIAL GASES

OXYGEN
ACETYLENE



HYDROGEN
NITROGEN

Quick shipment and low prices also on cylinders, valves, torches, regulators and supplies.

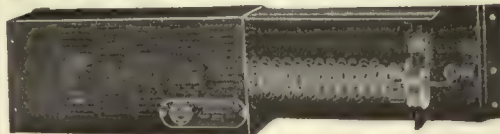
International Oxygen Co., Main Offices: Newark, N. J.
Branches: New York Pittsburgh Toledo

Hale and Kilburn SEATS

Better Quality Seats
For Cars and Buses

Hale-Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.

THE BEST TRUSS PLANK ELECTRIC HEATER EVER PRODUCED



No.
478E

GOLD CAR HEATING & LIGHTING CO., BROOKLYN, N. Y.



CHILLINGWORTH

One-Piece Gear Cases

Seamless—Rivetless—Light Weight
Best for Service—Durability and
Economy. Write Us.

Chillingworth Mfg. Co.
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RAIL BONDS—RAIL JOINTS
DYNAMOTORS
WELDING ROD

UNA Welding & Bonding Co.
Cleveland, Ohio.

RAILWAY UTILITY COMPANY

CAR COMFORT WITH HEATERS

UTILITY REGULATORS
VENTILATORS

141-151 West 22d St.
Chicago, Ill.

Write for
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1328 Broadway
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Manufactured by

CONSOLIDATED CAR FENDER CO., PROVIDENCE, R. I.

General Sales Agents

WENDELL & MacDUFFIE CO., 110 E. 42nd St., N. Y. C.





40 light-weight cars placed in service in 1923 resulted in a 12 per cent. increase in car miles per year, and an annual saving in maintenance, power and platform expense aggregating 15.2 per cent return on the investment.

New Cars—Worthwhile Economies

Substantial returns on investments result from economies realized with modern cars

The recently published report of the American Electric Railway Association's Committee on Essential Features of Modern Cars includes many excellent illustrations in which substantial returns have been obtained on investments in modern cars. While these vary from a few as low as 12.8 per cent up to 65 per cent, it is apparent

that the economies resulting from the substitution of light-weight modern cars for heavy and obsolete equipment are worthwhile.

These worthwhile economies are within your reach. The opportunity is offered you through a financing plan which will permit you to place up-to-date cars on your lines.

 **THE J. G. BRILL COMPANY** 
PHILADELPHIA, PA.
 AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MAN'G CO.
 ST. LOUIS, MO. — CLEVELAND, OHIO. — SPRINGFIELD, MASS.



The reduced expenses, and often increased revenue, mean such a large annual return on the investment that modern cars soon pay for themselves—and then they go on earning more than the obsolete cars they replaced.



New light-weight cars help retain railway service for "the Attleboros"

The history of the Interstate Street Railway covering recent months is another story of the power of modernization to make railway operation pay.

This road operated at a loss, passed into receivership and was sold at auction. Then it purchased lighter, attractive cars, G-E equipped; began one-man operation; increased schedule speeds; reduced sub-station costs by the adoption of automatic control; and promoted public good will.

Savings made during three months' operation total more than \$13,000—an annual return of 65% on the new-car investment.



General Electric equipment has been chosen for many of the recent outstanding, forward-looking car developments. It has helped to make many of the operating records which have established so conclusively the value of the modern light-weight car.

	Operating costs per car-mile for 3-month period during 1925		Reductions in operating costs per car-mile for accounts affected by the new cars	
	Old Cars	New Cars	Cents	Per cent
Way & Structures	4.10¢	2.38¢	—	—
Equipment	8.11	3.14	4.97¢	61%
Power	8.80	5.43	3.37	38
Conduct. Trans.	13.06	9.02	4.04	31
General & Misc.	3.52	5.93	—	—
Total	37.59¢	25.90¢	12.38¢	33%

GENERAL ELECTRIC

ELECTRIC RAILWAY JOURNAL



Fleet of White
2 1/2-ton emergency tower trucks
operated by the
Department of Overhead Lines,
The Brooklyn City Railroad Company

Extra Power and Speed When You Need It

Power for any purpose. . . Speed when you want speed. . . . That old extra punch when a hole or a hill seems to have you licked with your load.

That's a White. . . . It's any White—on any job. . . . All Whites are built that way; 24 hours a day is O.K. with Whites. They've got the stuff.

For Whites there's no job too big.

White Trucks and Busses are profitably serving more than 200 electric railways. The purchase of a White is assurance of continuous, sustained transportation at low cost. It is a guarantee that your investment is protected.

THE WHITE COMPANY, Cleveland

WHITE TRUCKS

A N D B U S S E S

A Veteran

-668,000 Wheel-passes

THIS frog has been in service for more than two years in one of our busy cities where loaded trolley cars bring the shoppers up the hill from the business district. During that time, 668,000 scheduled cars have passed under the frog, and the frog is not yet worn out.

Such long service results from a design in which the wheel travels smoothly through the frog. Properly curved runners keep the wheel riding true. Overlapping the runners prevents the wheel flange from touching the pan. Flexible bayonet approaches, easily removable, lead the wheel onto the frog without bumping or arcing.

CF trolley frogs keep down maintenance expense.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in all Principal Cities of
the United States and Foreign Countries

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A Veteran CF Trolley Frog
with 668,000 Wheel-Passes
to its Credit and not Done
Yet.

Westinghouse

Type CF Trolley Frog

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A Mutual Service

FROM the editorial, as well as the personal, point of view it is very gratifying to meet the infallible courtesy and ready welcome which are awarded to members of the ELECTRIC RAILWAY JOURNAL staff as they journey about the country, visiting hundreds of railway properties annually. No executive is too busy to pause for a chat, no master mechanic too engrossed in maintenance details to vouchsafe a personally conducted tour through the shops.

These railway men are constantly being confronted with time-consuming problems, yet to the JOURNAL editor is accorded whatever period is needed for the discussion of his mission. The reason for this may perhaps be found in the stimulated consciousness of the industry today that only in mutual service may the individual succeed. Through the columns of the JOURNAL the problems and triumphs of one are broadcast for the good of all. And the visiting editors bring with them a knowledge of the whole which may frequently be useful in suggesting ways to overcome an annoying obstacle confronting the individual company.

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SAVING THE RAIL SAVES THE RAILWAY

Making rides more marketable

Demand is built on desire. Tempt your public to ride. Make the temptation strong enough to overcome competition. It can be done—it is being done.

Quality in transportation sells rides. Quality in electric railway transportation means attractive equipment, speed, comfort and courtesy.

No matter what you do to give such service, your efforts must fail if you do not keep the roadbed in prime condition.

New cars are not attractive when they bump over corrugated track and battered joints. Speed is safe and comfort is possible only on good track.

Whatever you do, or plan to do, look first to your track. It's the very foundation of your business. Saving the rail saves the railway—and the equipment here shown saves rail economically.

Bulletins?
Quotations?
Both?

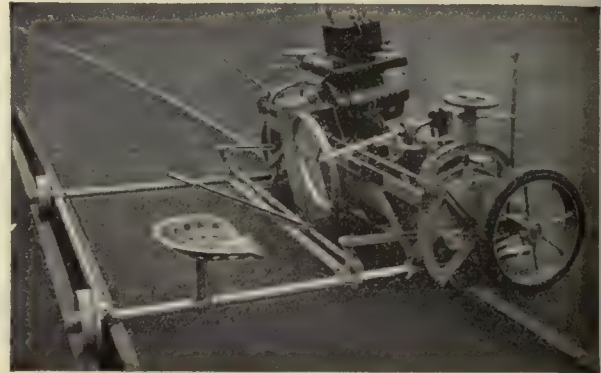
Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

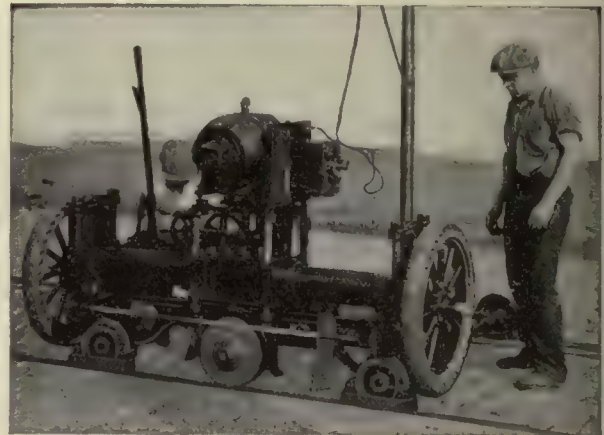
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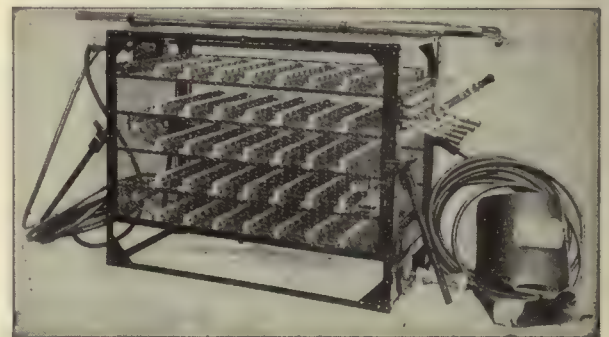
"Improved Atlas" Rail Grinder



"Imperial" Track Grinder



Reciprocating Track Grinder



"Ajax" Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY

Scranton Railway Company Another User of National Trolley Guard

PROGRESSIVE properties the country over are rapidly eliminating the hazards of overhead wirements at railroad crossings by installing National Trolley Guard at every place where such intersections occur.

Besides providing added safety and better car operation, such installations show a consideration for the car rider that is not unnoticed. They invite public confidence—promote good will.

Here is shown one of many protected crossings along the lines of the Scranton Railway Company, Scranton, Pa. More than 1,000 feet of National Trolley Guard is in service on this property alone.

Complete details on the advantages, use and cost of National Trolley Guard gladly sent on request.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
1918.

Ohio Brass Co.



PORCELAIN
INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING
MATERIALS
VALVES



Brake'em-hard!

QUICK starts—and even quicker stops!

Acceleration—2 m.p.h. per second!

Braking as high as 3 m.p.h. per second!

This is necessary to keep ahead of the other street traffic—the modern idea in trolley car operation. Such operation soon brings ordinary steel wheels to the shop.

Flats and shell-outs are more frequent.

Roads using Davis "One-Wear" Steel Wheels avoid this maintenance expense. Throughout their longer life, Davis Wheels needs no contour reconditioning. Their greater strength resists the greater stresses of modern operation.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



Relaying Track Without Inconveniencing Riders

Night work is not uncommon with electric railway maintenance employees, as they must continually make repairs and replacements or install new construction without interfering seriously with car service. Ingenious methods must be devised and work planned carefully to the minutest detail so that car riders will not be inconvenienced. The above illustration shows how track on Euclid Avenue in the downtown section of Cleveland

was relaid at night. Floodlights installed in the overhead produced the illumination. New rail was laid on an old concrete base using, of course, *Steel Twin Tie Track*. In this installation, flat bars instead of channel connections between bearing plates were used.

May we send you detailed information on "Steel Tie Track Construction," cost figures, and delivered price on Twin Ties?

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track — Permanent Foundation

Low Maintenance



IT COSTS between three and four dollars to rip up a foot of track to renew ties. This staggering expense will be repeated and will mount if you continue to use inferior or untreated ties.

Do not try to save a few cents per tie and sacrifice quality and later pay the penalty of early tie renewals and costly track maintenance.

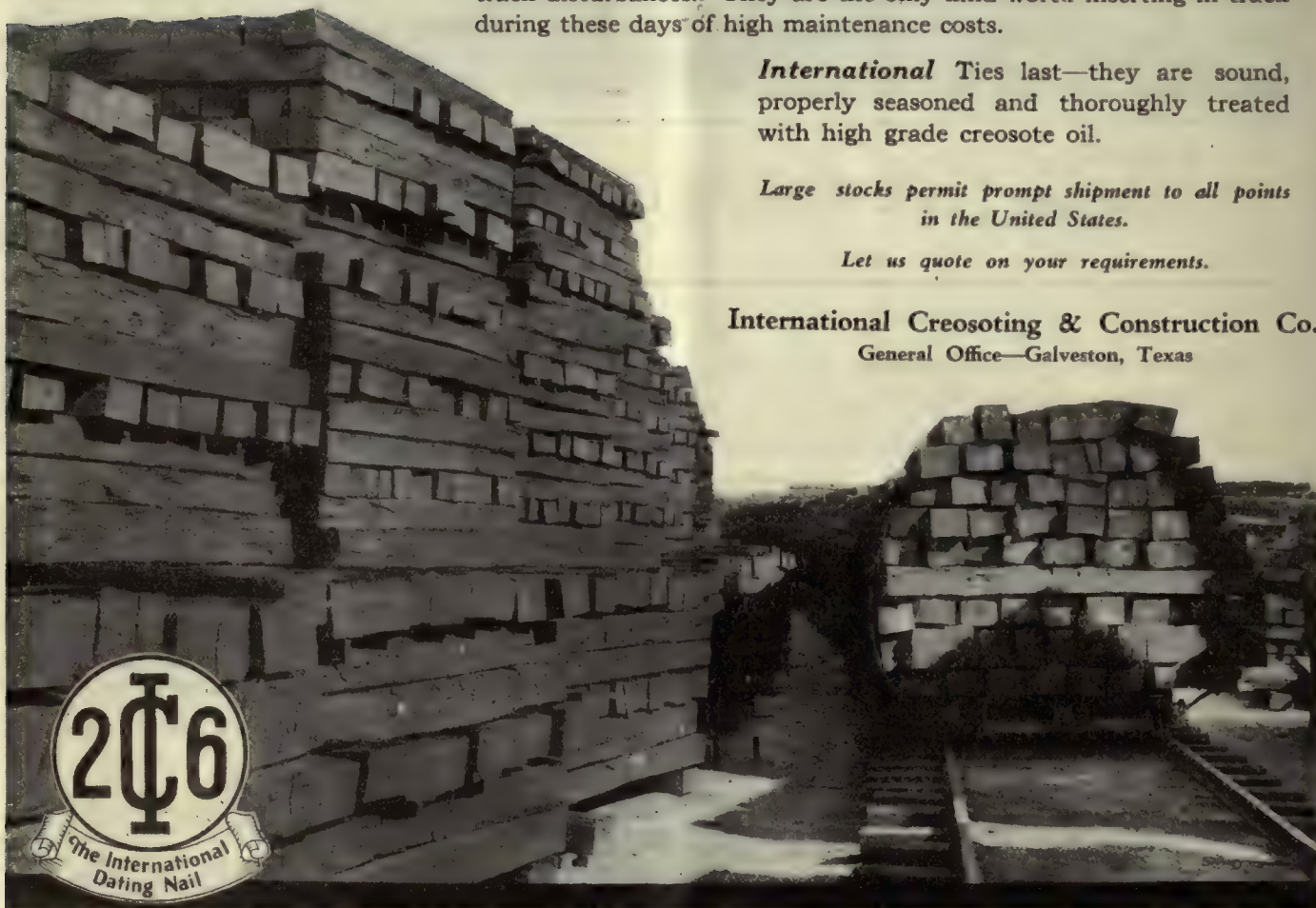
You must have ties of sound lumber thoroughly treated to minimize track disturbances. They are the only kind worth inserting in track during these days of high maintenance costs.

International Ties last—they are sound, properly seasoned and thoroughly treated with high grade creosote oil.

Large stocks permit prompt shipment to all points in the United States.

Let us quote on your requirements.

International Creosoting & Construction Co.
General Office—Galveston, Texas



International

**HIGH GRADE
CREOSOTED TIES**

ESSCO BULLETIN

Devote this week
to improving —

Publicity!

Keep these always
in mind —

*Safety
Publicity
Illumination
Convenience
Maintenance*

TO "TELL the public where you're going" is a logical and effective way to advertise your service.

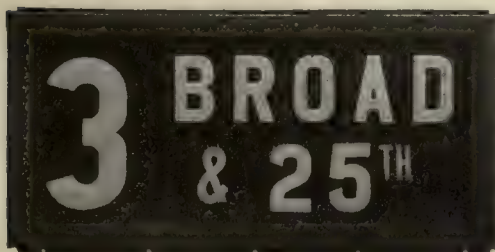
For this purpose use clear, clean, readable Hunter-Keystone Signs to indicate the destinations of your cars. Bold white letters on black roller curtains provide high visibility by day and by night.

Send for further particulars.

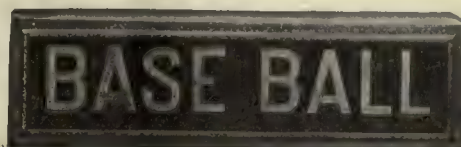
ELECTRIC SERVICE SUPPLIES Co.

PHILADELPHIA NEW YORK CHICAGO
17th and Cambria Sts. 50 Church St. Ill. Merchants' Bank Bldg.
PITTSBURGH BOSTON SCRANTON
1123 Bessemer Bldg. 88 Broad St. 316 N. Washington Ave.
DETROIT—General Motors Building
Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

HUNTER-KEYSTONE SIGNS



For a complete list of Hunter-Keystone Destination Signs for railway cars, see our Catalog No. 7—for bus types get Catalog No. 9.



Typical Hunter Sign Curtain



Seats That Help to Sell the Service

Whether the service is urban, suburban or interurban, seats play an all-important part in selling the service to the riding public. Hale-Kilburn Seats are designed and built to meet your most exacting requirements. Write for catalogs.



**Bus Seat
Type 208**

Designed especially for bus service, this 208 De Luxe Type has divided back, spring cushions and air cushion pad—upholstered in leather or imitation leather as specified.



**Car Seat
Type 199-F**

Made with plush upholstered spring edge cushion and detachable back, this seat meets the requirements where an inexpensive but comfortable seat is needed for suburban and light-weight interurban cars.



**Car Seat
Type 392-EE**

Built for the finest interurban cars, this seat has extra high three-part headroll, mahogany capped armrest and metal parts of pressed steel for light weight. Plush upholstery or other materials as specified.

HALE-KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

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Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta

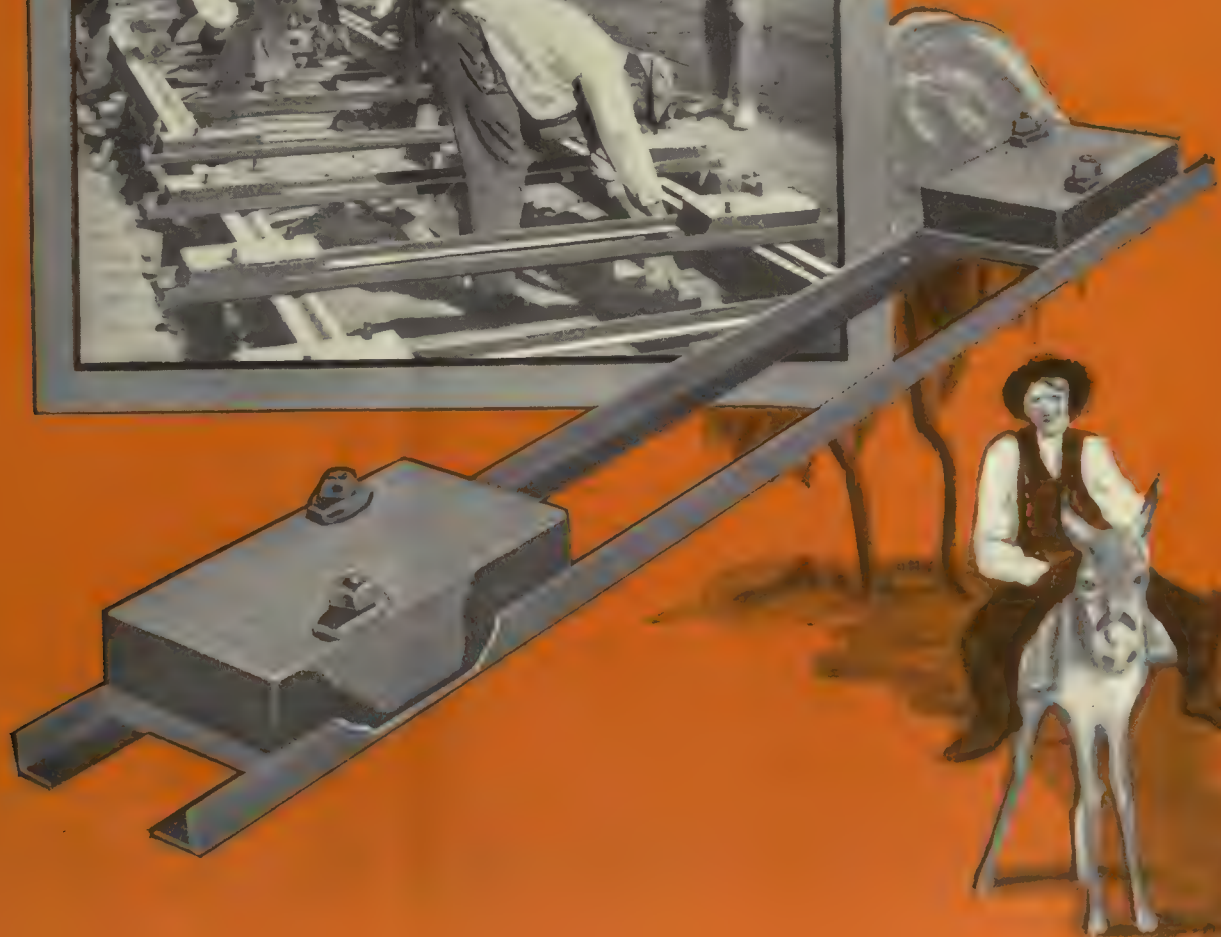
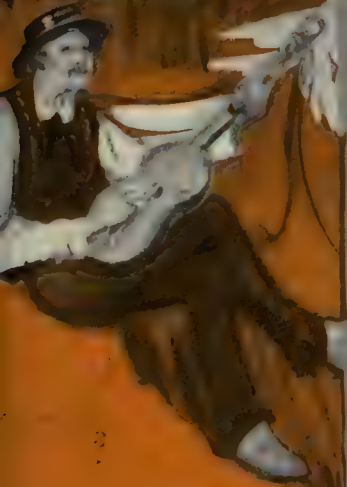
Frank F. Bodler, 903 Monadnock Bldg.,
San Francisco
Chris Eccles, 320 S. San Pedro St., Los Angeles
T. C. Coleman & Son, Starks Bldg., Louisville


W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Fractorian Bldg., Dallas, Texas
W. D. Jenkins, Carter Bldg., Houston, Texas
H. M. Euler, 46 Front St., Portland, Oregon

Hale and Kilburn SEATS



*Spain desires
permanence*



An illustration at the top of the page shows a Spanish Tramway. It features a horse-drawn carriage with several passengers, including a driver and passengers in traditional Spanish attire. The scene is set against a backdrop of a hilly landscape with some buildings.

LABOR is cheap in Spain. The labor end of track maintenance of a Spanish Tramway would look ridiculously small to an American railway engineer.

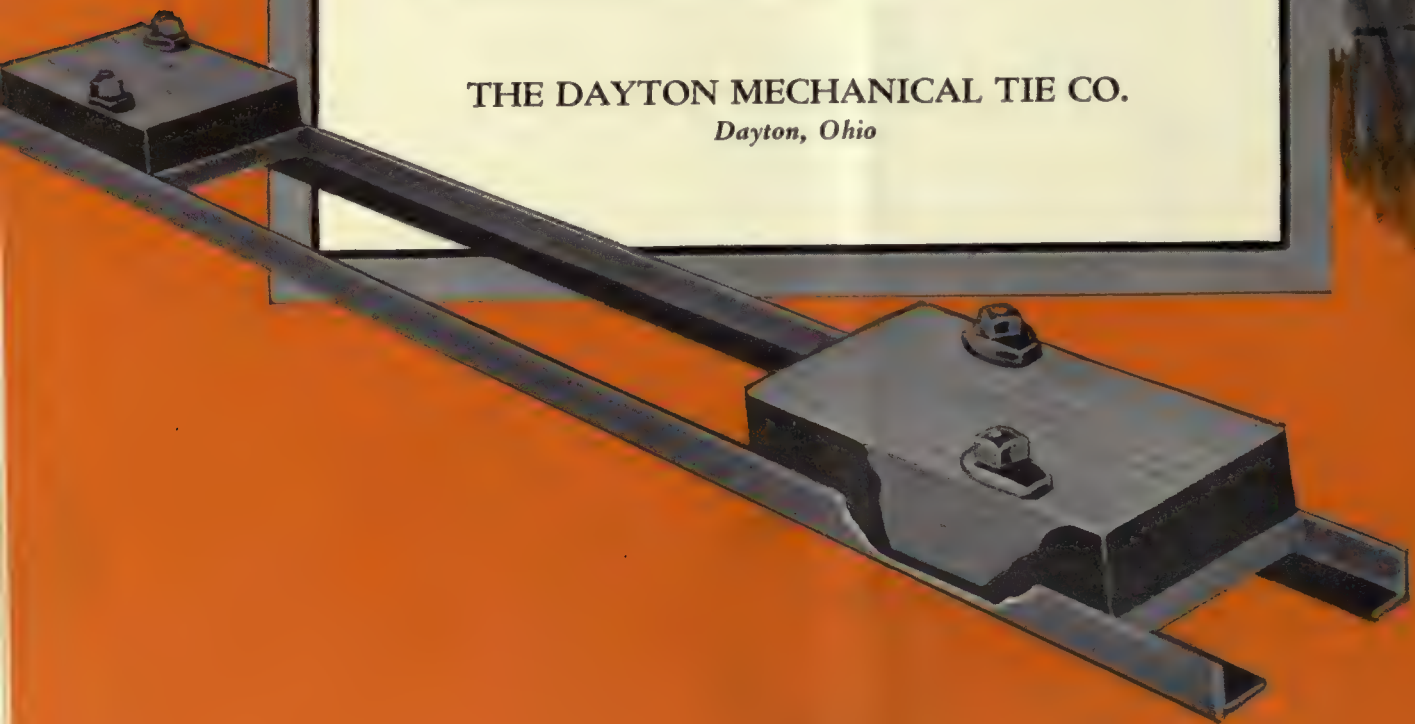
But Spain desires permanence. A country abounding in magnificent structures that have endured since the world was believed flat, and America was undreamed of, Spain does not take kindly to constant repairs and frequent renewals.

It was the consideration of permanence and low maintenance which led engineers of the Barcelona Tram Co., Barcelona, Spain, to use Dayton Mechanical Ties.

Dayton Ties far outlast any other form of sleeper yet devised for street railway. Maintenance under heaviest traffic is insignificant, rolling stock repairs are cut in half, riding is easier, and noise is reduced.

These features are surely as useful to you as to Barcelona. Investigate Dayton Ties. Write us and we will forward complete information.

THE DAYTON MECHANICAL TIE CO.
Dayton, Ohio





MORE MILEAGE PER DOLLAR OF COST

What, next to safety and dependability, is the most important requirement you look for in wheels for electric railway service?

Isn't it economical mileage—greater service per dollar of cost?

The Illinois Steel Company begins to build economical mileage into Gary Wrought Steel Wheels at the very first stage of manufacture, where the specialized knowledge gained in years of steel-making experience is utilized to produce the cylindrical block of high-grade open-hearth steel that eventually becomes the finished wheel.

The care with which the open-hearth record and chemical composition are checked, and the painstaking way in which all blocks are chipped and inspected, are further steps in the journey.

From the wheel block yard, down on to the ten-thousand-ton hydraulic press, the hub punch, the rolling mill, the coning press, the first inspection, the machining operation, the second inspection and the warehouse—the course of Gary Wheels toward economical mileage is unswerving.

All of which helps to explain the favor these wheels enjoy. Our wheel specialists are at your command.

Illinois Steel Company

General Offices: 208 South La Salle Street, Chicago, Illinois

G A R Y
WROUGHT STEEL WHEELS





Bates Structures for *better class overhead*

Working in close cooperation with some of the leading railways of the country, and devoting much time and study to their problems, has enabled us to develop types and methods of building overhead structures of a superior character. Bates "Double Expanded" members, utilized in "Bates Semi-Fabricated"* construction, provide greater strength and appreciable economy in production. This saving is reflected in lowered costs to you—You will be interested in a Bates estimate.

*The uniting of Bates expanded steel truss sections with standard steel structural members, utilizing to the fullest extent the peculiar advantages of both, is termed "Semi-Fabrication."

INTERNATIONAL
STANDARD ELECTRIC CORP.
General Export Distributors
SAMUEL BROWN, LTD., New Zealand
JOST ENGINEERING CO., LTD., India

*Specify
Bates*

Bates Expanded Steel Truss Co.
Sales, Engineering and Executive Offices
EAST CHICAGO, INDIANA

222,964 MILES on Timken Bearings

Three years—a quarter million miles—of shock, thrust and speed have not affected the Timken Bearings in the Gulf, Texas and Western's first Brill gas car. It shows how Timken Bearings are capable of changing accepted operating ideas.

Timken-mounted axles—or any other parts—stay in line permanently without bearing overhaul or replacement, because wear is negligible. Excess friction is gone. The rolling motion is taken entirely on supremely enduring Timken-made bearing steel. Thrust is absorbed by Timken Tapered design with as little friction as radial load. Shock meets the resistance of greater load area in Timkens. Precision is permanently preserved by *TIMKEN POSITIVELY ALIGNED ROLLS*.

The full worth of Timken Bearings in Rolling stock is attested by the list of Timken-equipped gas-mechanical and gas-electric cars. Brill and every other prominent make is included.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN
Tapered
ROLLER BEARINGS



WINDOWS DO MAKE A DIFFERENCE



Modern Street Cars *call for* Modern Windows

Electric railway authorities say that there are 25,000 obsolete street cars in service today!

25,000 cars that should be replaced at the first possible opportunity. And many more that need modernizing.

What is a modern street car?

It is light in weight, but sturdy. It is neat and trim in appearance. It is comfortable. It is quiet. It is warm in winter and airy in summer.

And all these necessary features are attained in no small measure by the use of

Edwards Metal Sash

WINDOWS DO MAKE A DIFFERENCE

Edwards Metal Sash fits in with every modern idea in street car construction.

It is light in itself and permits of lighter upper construction.

It makes windows quiet on any kind of road bed, at any speed—whether they are open or closed.

Edwards Metal Sash makes street car windows air-tight in the coldest of weather. And yet the windows are easily opened.

It affords a maximum of glass area. The sash is narrow, and because it requires no sash lock racks, the posts too may be narrow.

Makes Perfect Windows!

Edwards Metal Sash makes perfect street car windows—for both the company and the passengers.

Passengers enjoy the extensive glass area; the company appreciates the saving in weight.

Passengers enjoy the freedom from rattles, the easy opening, the safe closing; the company appreciates the almost total lack of upkeep expense.

Passengers enjoy the warmer cars in winter while the company's management surely appreciates the saving in heating costs.

From many standpoints Edwards Metal Sash has a big share in making modern street cars.

Car builders and electric railway companies will be interested in full details of Edwards Metal Sash. Address

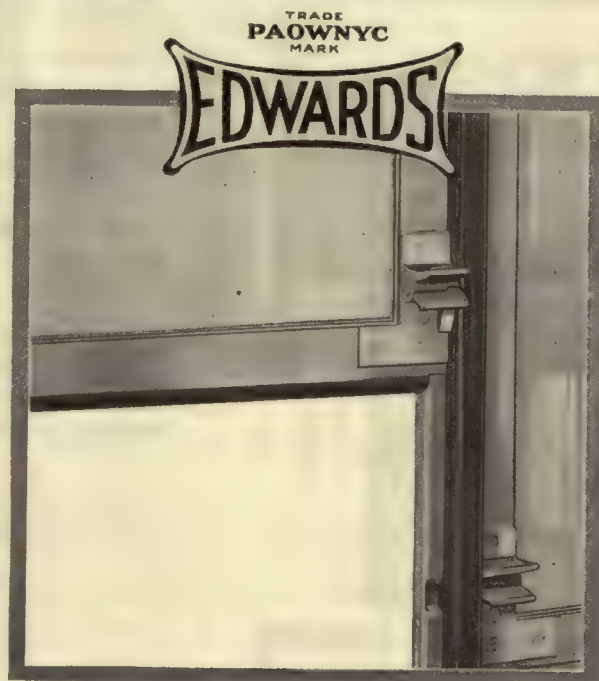
O. M. EDWARDS CO.,

Syracuse, N. Y.

Canadian Representatives:

Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

Cars now being completed by the Cummings Car and Coach Co., for the Chicago & Joliet Railway, and by Canadian Car and Foundry Co., for the Montreal Tramways and British Columbia Electric Railway Co., are being equipped with Edwards Metal Sash.



Signals

and their Diversified Applications.

Have you more than scratched the surface to uncover available means of protecting and speeding up your traffic, and are you experiencing delays or perhaps accidents which might be eliminated by the use of one or more of the following means?



1.—Automatic semaphore or color light block signals, controlled by continuous track circuits.



2.—Electro-pneumatic, electric, electro-mechanical, or purely mechanical interlocking systems at terminals or at grade crossings with other railway lines.



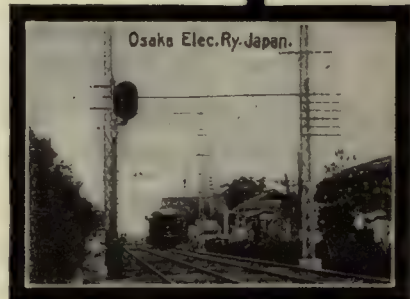
3.—Highway crossing protective devices of flashing color light, wig-wag and audible types or combination of same.



4.—Remotely controlled switches at outlying sidings.



A statement of your problem places you under no obligation and if it appears to our engineers that your conditions can be improved by installation of our materials, we shall be glad to furnish complete details.



Electric Railways which are large users of Union automatic signal and interlocking systems are:

Chicago, Lake Shore & South Bend Ry. Co.
Chicago, South Bend & Northern Indiana Ry.
Kansas City, Clay County & St. Joe Ry. Co.
Washington, Baltimore & Annapolis Elec. R. R.

Interstate Public Service Co.
Pacific Electric Ry. Co.
Illinois Traction System
United Elec. Rys. Co.

Scranton & Binghamton R. R. Co.
United Railways & Elec. Co.
San Francisco-Sacramento R. R.
Northern Texas Traction Co.



Union Switch & Signal Co.

SWISSVALE, PA.





Increasing the Utility of Motor Transportation

Speedy highway transportation with the same degree of safety that the riding public has become accustomed to on railway vehicles attracts patronage.

Short, smooth stops, made without discomfort to patrons, permit higher schedule speeds and better running time.

Powerful retarding force, equalized to minimize skidding, easily controlled, and without driver fatigue, insures maximum safety under all road, traffic, and load conditions.

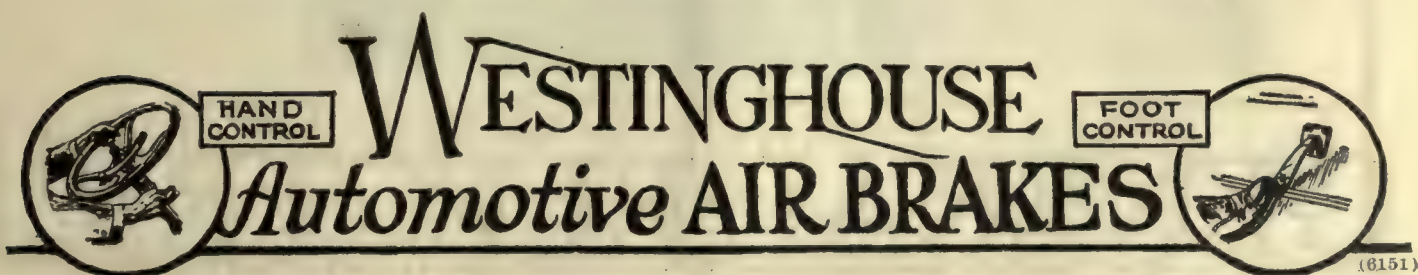
Automatic equalization of braking forces lengthens the life of linings and reduces frequency of adjustment, which results in a saving of material, labor and layover charges—economies which are even more marked if metal-to-metal brake shoe equipment be used.

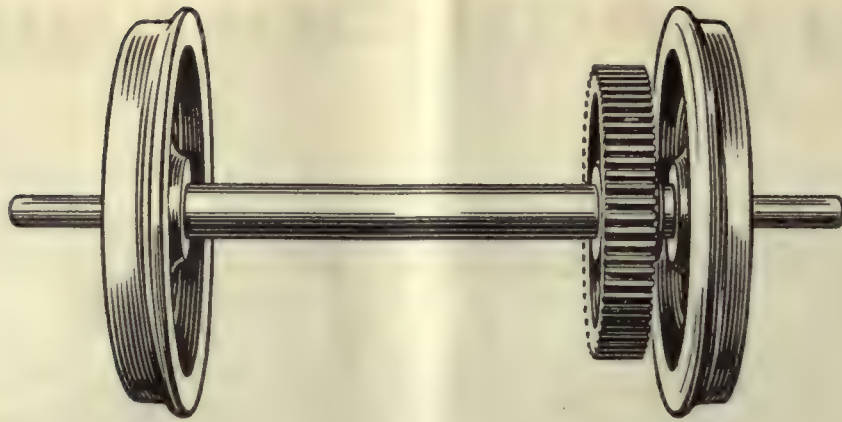
Westinghouse Air Brakes are increasing the utility of motorized transportation on many traction properties.

WESTINGHOUSE TRACTION BRAKE CO.
AUTOMOTIVE DIVISION
General Offices and Works, WILMERDING, PA.

with

**WESTINGHOUSE
AUTOMOTIVE
AIR BRAKES**





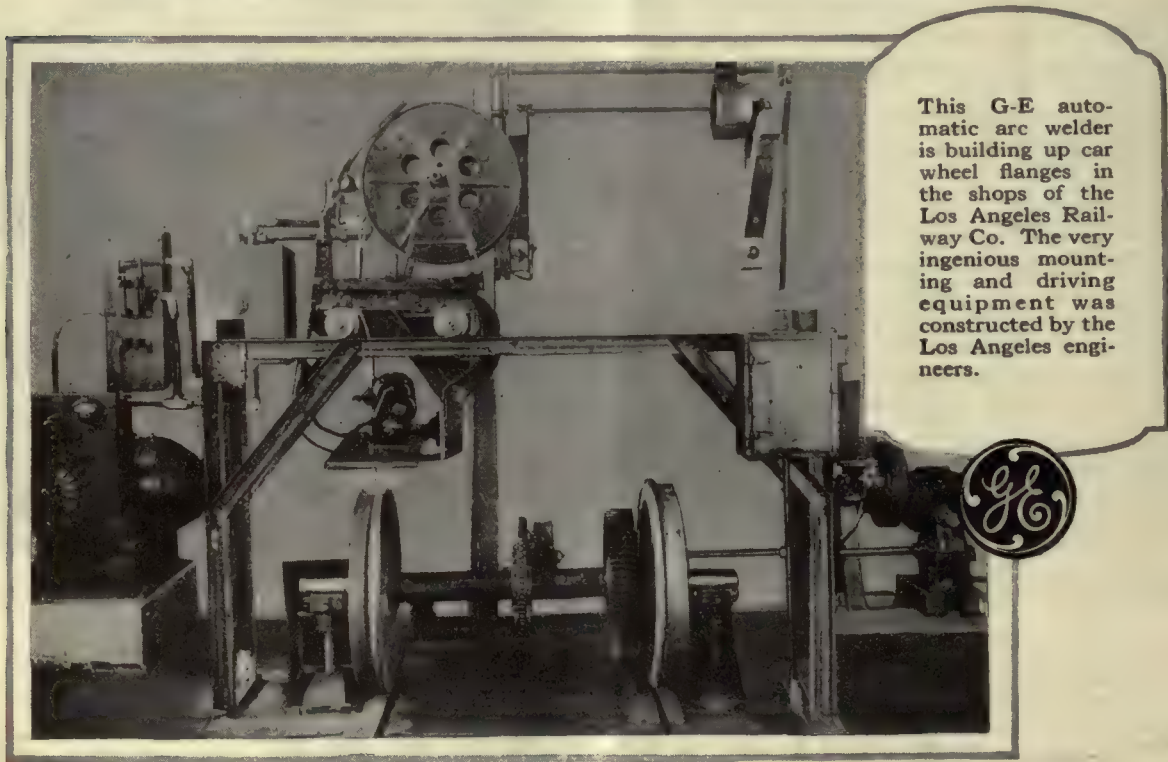
Down or Up ?

ARE you machining your worn car wheel flanges down—wasting material and time—or are you building them up—saving material and time—with a G-E automatic arc welder?

Here are some of the electric railways using G-E automatic arc welders to reclaim their worn car wheels:

Los Angeles Railway
Springfield (Mass.) Street Railways
Worcester Consolidated Railways
Detroit Municipal Railways
Kansas City Railways
Denver Tramway Co.
Northern Texas Traction Co.

In each case, the railways report that the job is being done with a speed, economy, and high quality of work unequalled by any other method yet attempted.



This G-E automatic arc welder is building up car wheel flanges in the shops of the Los Angeles Railway Co. The very ingenious mounting and driving equipment was constructed by the Los Angeles engineers.



GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, August 7, 1926

Number 6

Giving Real Trolley Service a Chance

THE good citizens of upper Westchester County, which is immediately north of New York City, rubbed their eyes when they read that the Westchester Street Railroad, a New Haven subsidiary, had not gone to the junk dealer on July 19, but had been bought for continued operation by the Union Railroad, a subsidiary of the Third Avenue Railway system of New York City. Thereby hangs a tale.

Way back in 1909, when the New York, New Haven & Hartford Railroad was acquiring every electric railway in sight, it purchased for approximately a million dollars a system which has now been knocked down by the auctioneer's hammer at \$70,000 for some 20 miles of track. The territory served comprises a number of New York suburbs of high-grade character.

In recent years the equipment has been allowed to deteriorate to such a degree that it is no exaggeration to say that the public was unwilling, if not afraid, to use the trolley. Confirmation of this is suggested by the fact that the new owners found they had to deal with a track that had spread an extra inch! Hand in hand with this shabby property went an inequitable system of fares with a dime charge over a distance short enough for many persons to walk.

It is not for us to say whether or not this condition was avoidable under the circumstances. The blunt fact is that the public not only stayed away, but came to the conclusion that the cure-all lay in the use of motor buses. In line with this sentiment, the receiver of the Westchester Street Railroad organized the County Transportation Company to build up a county-wide bus system. His intention was to scrap the trolley and use buses both on the former trolley routes and on many new ones. However, this intention could hardly have been carried out within the immediate future because of the great rivalry for bus franchises and the absence of a central county authority which could deal with the matter as a whole.

So confident was the public that the trolley was doomed to go that the Mayor of White Plains, the largest community affected, expressed considerable astonishment on learning that the Third Avenue Railway management had not bought the lines just to enter the junk business. The management explained that opposition to the kind of trolley service lately provided was natural enough, but from what it knew of the relative cost of up-to-date operation with both car and with bus it wanted to make a trial of real trolley service first.

The new management is surely entitled to a little patience on the part of the Westchester public. Any visitor to Manhattan and Bronx Boroughs cannot help note the excellent appearance of this company's rolling stock. In the lower Westchester towns of Yonkers, Mount Vernon, Pelham, New Rochelle, etc., where the same management has had control for years, the com-

pany's cross-seat, convertible car was a real contribution to the art when others deemed the longitudinal-seat car good enough for New Yorkers. Residents in territory hitherto served by this company have no reason to think the trolley passé. The same feeling is likely to come to upper Westchester in the near future.

Political Entanglements Are Dangerous

NATION-WIDE publicity is being given to the inquiry, by a committee of which Senator Reed is chairman, into the conduct of the senatorial campaign in Illinois last spring. The principal contestants for the Republican nomination were Frank L. Smith, chairman of the Illinois Commerce Commission, and William B. McKinley, chairman of the board of the Illinois Power & Light Company. Mr. Smith has filled his recent office creditably. Mr. McKinley has served his constituency well over a long period of years. But on their face, some of the facts now being brought out have an ugly appearance. That utility men contributed liberally to the campaign funds of both candidates was probably well known long ago. The extent of these contributions is perhaps the new thing.

It costs money, lots of it, to canvass a state, and funds are sought far and wide. It would, of course, be jumping at conclusions for the public to assume that the utilities had anything more to gain by the election of either one of these candidates than did the others who contributed to their funds. As further facts are brought out it will probably be disclosed that the pressure for funds was equally persistent in all quarters. Still it will be the utilities, undoubtedly, that will feel most the public reaction to the so-called disclosures, given a tinge in the daily papers that they really do not deserve. That, of course, is particularly unfortunate, because long and continuous efforts toward better public relations are just beginning to bring about results.

The excuse may or may not be tenable that the utility executives did only what others did. But they are not in the same position before the public as are those in other business enterprises. Although they are subject to the same pressure for campaign contributions as are others, the necessarily monopolistic character of their operations and their dependence on regulation by public officials place them in a particularly unfavorable light in newspaper headlines.

Utilities have lost more than they have ever gained in the past by political activity. They must be held above even the possibility of popular suspicion, for in the confidence and the good will of the public itself, rather than that of administrative or regulatory officials, lies the security of their future. Upon the utilities themselves rests the responsibility for assuming the initiative in avoiding the entanglements of political campaigns.

Violators of Strike Injunction Sentenced to Jail

SERIOUS consequences have followed the Amalgamated Association officials who are held by a United States District Judge, sitting at Indianapolis, to have ignored the terms of a strike injunction issued against them. These officials are in jail. One of them is alleged to have boasted that he knew more about injunctions than did the court. This wasn't all he said. But he did say enough for the court to characterize the criticism as contemptuous. The pleading in extenuation of his act and the precautions he thought he took did the Amalgamated man no good. The court had no idea of dealing leniently with the violators. So a jail sentence was imposed. As the court so aptly said, for it to have imposed a fine would merely have been to fix a fee at which its command might be flaunted.

What is believed to be a correct account of the proceedings is published elsewhere in this issue. It makes the case against the organizers plain. There is no need to go over the facts in connection with the strike. They have been reported from week to week in the JOURNAL since the inception of the trouble. One thing does, however, stand out. Considerable vandalism has attended the conduct of the strike. No matter from what source these acts have emanated, their existence is a fact. For them there can be no excuse. That is how the court has felt about it. It has acted to preserve the peace. The boast of one of the convicted men was reported to have been that he had a bushel basket full of injunctions at home and that an injunction didn't bother him.

As for the strike, it appears to have petered out. The company apparently experienced little difficulty in filling the places of the men who went out. Moreover, those who did go out are now clamoring to be taken back. So the double lesson is brought home to the strikers that disrespect of the law is a serious thing and that vandalism, even as a resort of the desperate, always hurts most those who indulge in it.

Competition with Private Car Should Be Objective of Bus

DISCUSSIONS of the field for the bus and the street car have occupied much of the attention of transportation men in the past few years. But study of the extent to which buses may be substituted for private automobiles may well occupy their attention in the future. All forms of common-carrier agencies have finally realized that they have less concern with the development of each form of vehicle than they have with the common competitor of all public agencies, namely, the privately owned car.

Progress is now being made in developing street cars to the point where they may be expected to attract many present automobile riders. In this program the railway has a large price factor in its favor. Relief from traffic and parking worries is no small element of advantage in the service the railway has to offer.

But the street car must remain the poor man's vehicle. Minimum possible fare consistent with adequate service will continue an important consideration. There will, therefore, be many who insist on greater luxury and more exclusiveness in their travel accommodations. These will be reluctant to ride with the masses regardless of cost, convenience or even comfort. It is in offering a common-carrier service to such people that the bus seems to have its greatest possibilities. The nearer such

bus service can be made to approach the speed and exclusiveness of the private car, the greater will be the total number of automobile riders that can be attracted. There is a wide margin of cost to work in, while traffic congestion and parking difficulties favor successful development of such service. Instead of being relegated to operation only in small cities, this type of bus service seems to offer greatest opportunities for development in large, congested communities.

There has been too much tendency in bus design and operation to think in terms of street car capacities, street car service and street car fares. The nearer buses can be made to approach the desirable features of the individual car, the larger will be the number of private car users who will patronize them. It is significant that buses in tour service, which to a considerable extent has been pleasure service and approaches nearest to private car facilities, have proved most remunerative to their operators.

Spokesman for Retail Merchants Discovers a Plot

CONSPIRACY by the transportation interests to cripple the private automobile as a means of passenger conveyance within cities is what William J. Pedrick, vice-president and general manager of the Fifth Avenue Association, New York City, calls the recent agitation for elimination of parking. The prosperity of the retail merchants depends very largely upon private automobile trade, he says, and in support of this contention he refers to a nation-wide survey made by the Department of Commerce showing a widespread belief in the importance of this vehicle in the general transportation scheme.

Because the retail merchants of Fifth Avenue, and some of those replying to the questionnaire of the Department of Commerce, honestly think that their prosperity depends upon automobile trade, it does not necessarily follow that they are correct. Wherever actual counts have been made to determine the means of transportation used in reaching retail stores it has been found that a large majority of the customers use public transportation vehicles. A count made at the entrances of several well-known Fifth Avenue stores during a busy shopping hour showed only 414 customers using private automobiles or taxicabs out of a total of 12,473. Among 15,229 persons interviewed at four large Chicago department stores only 1,680 came by automobile. In Cleveland a poll was recently made of 22 of the largest stores and showed 19,551 private automobile passengers out of a total of 85,657 shoppers. In Los Angeles a similar count indicated 2,058 coming by automobile out of 20,117 customers.

Experienced transportation men are sufficiently familiar with these facts, but they have not yet been brought home to the merchants. The latter insist that private motor cars be allowed to park for long periods on even the busiest thoroughfares. Inevitably congestion results. Increasing hesitancy to fight their way in this congestion is shown by the residents of outlying districts. They are doing more and more of their shopping locally. Therein lies the real danger to the big city stores. The most effective way to convince the retail merchants that they attach exaggerated importance to the private automobile trade is to have them make actual surveys of the means of transportation used by their customers. The subject is of vital importance to them as well as to transportation companies. Agita-

tion looking to the relief of traffic congestion is in the public interest. It is only when private interest is placed ahead of the public's need that collective activity is subject to criticism. In that respect the retail merchants do not have a particularly enviable record. This question of traffic and parking should be settled on the basis of facts, not opinions.

Confusion in the Air

and Confusion on the Highways

MUCH depends on whose ox is gored. Mr. Average Citizen has turned a deaf ear to the arguments that the free-for-all competition permitted under the interstate bus decisions of the United States Supreme Court was producing chaos in the local transportation industry. Now comes the ruling of the Attorney-General that the Secretary of Commerce has no authority to exercise regulatory control over radio broadcasting activities. Six months ago Mr. Average Citizen cared not one whit whether any real effort was made to co-ordinate and regulate the various transportation elements. Today, however, his own ox is in danger of being gored. His enjoyment of his favorite jazz orchestra may be rudely shattered by the too close paralleling of wave lengths on the part of rival broadcasting stations. The transportation problem is his, even as the radio difficulties, but he must be brought to realize his stewardship. He must be convinced that lack of regulation and unnecessary duplication of service will prove even more harmful to his general wellbeing than the present lack of control in the industry upon which he relies so much for entertainment.

Earnest Work of Southern Properties Equipment Men Productive of Pronounced Savings

TANGIBLE results in the way of reduced maintenance expense can be traced directly to the two meetings a year of the Association of Southern Properties Equipment Men. The last meeting, held in Chattanooga July 28-30, completes four and a half years of activity by this organization, participated in by some fourteen properties in the Southern states.

In preparation for the semi-annual meeting the key figures of each property were charted in their relative order and merit from reports made monthly to the president. Of course, there are a high and low, but no excuses are offered. The men meet with their cards on the table face up. The low men check their results with each other and the high men are just as keen to learn how to notch their showing up still higher.

That this frank comparison of practices is more than worth while is shown by the steady increase in mileage per pull-in as reported on many of the properties, and the ever decreasing cost of maintenance. The improvement is brought about to some extent by the friendly rivalry between properties. But the most important factor in stimulating progress is the exchange of experience at the semi-annual meetings.

One day of the meeting is devoted to the presentation of papers giving actual experience with methods or materials. No time is wasted in preliminaries or idle words. Some of the papers abstracted elsewhere are reproduced almost in full and their brevity and concise statement of facts will be readily observed by the reader. Approval or disapproval of materials or methods is stated frankly.

A second day of the meeting in Chattanooga was devoted to a discussion of some 50 questions compiled during the previous six months. Each question was discussed by delegates from each property represented. Little doubt was left in the listeners' minds as to the conclusions of each property regarding a given item of practice.

On the third day the men visit the shop of the property acting as host to the delegates. Then methods used can be observed at first hand. The whole program tends toward the production of concrete improvement in maintenance methods. An examination of the charts indicates the substantial value of this kind of an association.

Another similar group of maintenance men makes up the Central Electric Railway Master Mechanics Association, which soon after its organization quickly brought about the design of a standard freight car for the network of properties in the C.E.R.A. territory. The need for such a standard had been felt for many years. Properties in other sections of the country might well inquire closely into the work done by these associations of men charged with maintenance responsibility.

Inflexible Franchise Terms

Based on Former Lack of Control

OSCAR L. POND, in an article published elsewhere in this issue, points out some of the fundamental advantages of indeterminate franchises and calls particular attention to the obsolescence of the old contract form of fixed term franchise under modern conditions of commission regulation.

The contract form of franchise was developed before the growth of regulation. Under those conditions the terms of the franchise itself offered the community its only adequate protection against excessive rates and inadequate service. It was obviously the duty of public officials to write into such franchises the maximum number of specific provisions regarding the conditions and terms of the grant. Since a franchise of this kind was an instrument to protect the community's interest over a long period of time, as well as to give the utility the right to place its rails in the public streets, these documents fairly bristle with detailed specifications and requirements. Changed conditions and progress of the art made many of the inflexible provisions of such franchises serious obstacles to transportation improvement and development.

One of the most important advantages of modern regulation lies in the fact that it permits franchises to be made more general and flexible in their provisions. The interests of the community, now adequately protected by commissions charged with authority to supervise both service and rates, no longer require elaborate specifications and detailed safeguards within the franchise itself. Thus the modifications required by changing conditions may be met as they arise.

There is still a tendency in some instances to load franchises with many of the inflexible provisions common in pre-regulation days. But those communities which have recognized the need for franchise flexibility are beginning to reap the reward in the form of transportation development and improved service. As Mr. Pond so convincingly points out, the terminable form of grant permits such flexibility and at the same time insures continuity of progress and improvement.



Refinishing the Car Exterior Has Greatly Improved Its Appearance and Aided in Popularizing the "Pioneer Locals" Service of the Northern Texas Traction Company



The Car Interior Has Been Much Altered and Improved. The "Pioneer Locals" Are Equipped with Seats Similar to Those of the "Crimson Limiteds"



Before Reconstruction the Same Car Presented a Far Less Attractive Appearance

Northern Texas Traction Operates the "Pioneer Locals"

Interurban Equipment Rebuilt for One-Man Operation Is Outstanding in Appearance and Comfort—Cars Are Named After Five of the Most Distinguished Citizens and Characters in Texas History

INSTANT public approval and enthusiastic reception met the inauguration of the "Pioneer Locals," the new de luxe one-man interurban equipment recently placed in operation on the Cleburne Division of the Northern Texas Traction Company. This company has again demonstrated its faith in electric railway transportation and in the policy of furnishing the public with attractive and comfortable cars, with frequent, fast and safe service, as a means of securing more riders and more revenue and holding the present business.

Last year the company rebuilt all the interurban equipment on the Dallas Division running in limited service and developed the "Crimson Limiteds," with their brilliant color scheme, individual chairs, observation sections and other improvements and refinements in comfort for passengers. More recently it has completely rebuilt all equipment used on the Cleburne Division and developed what are called the "Pioneer Locals." These cars have been changed over to enable them to be operated by one man, thereby effecting a saving of \$12,000 per year in operating costs, which is the total cost of rebuilding five of these cars.

The exterior color scheme of maroon on the body below the window and cream above the windows and panels, with gold striping and lettering, and the inside colors of gray for walls and baseboard, with cream ceilings, presents a car that instantly demands attention and appreciation. The inside of the car is furnished with individual air cushion chairs, similar to the ones used on the "Crimson Limiteds" in the observation section, while the front portion is fitted with blue-gray Kemi-Suede, with back and head rest covers. The floor is covered with extra-heavy green cork linoleum. All inside metal fixtures, such as hat hooks, light sockets, seat handholds, cuspidors, water cooler faucet, etc., are nickel-plated. All the iron stanchions and piping are painted with aluminum paint. The rear end of the car has a small awning that both improves the appearance and keeps the sun out of the observation section.

The cars are named after five of the most distinguished and outstanding characters in Texas history, whence the name "Pioneer Local" is derived. The name is placed on each side of the car in gold lettering on a black background. A picture of the man for whom the car is named is placed over the bulkhead of each car, in an attractive frame 18 in. high and 15 in. wide.

Several days previous to the inauguration of this service "teaser ads" appeared in Fort Worth and



Striking Advertisement Used by the Northern Texas Traction Company at the Inauguration of the "Pioneer Locals" Service

Cleburne papers, with wording such as "Pioneers Are Friends of Your City," "Remember the Pioneers, They Made Texas," etc. These ads caused quite a lot of speculation as to what they had reference to. On Saturday, the day previous to starting the new service, a half-page ad was run in local papers in both Fort Worth and Cleburne. This, and other advertising done, gave the cars a good send-off and had the public thinking and talking about them.

This line is 32 miles long, and Cleburne, the southern terminus, has a population of 15,000. An hourly service is maintained out of both Fort Worth and Cleburne

What Can the
Pioneers
Do for You?

The Pioneers
Are Coming Back

P-i-o-n-e-e-r-s
Are
Friends of Your City



Bell Cord, Baggage Racks, Ventilator Operating Rods, Etc., Cluttered Up the Interior of the Old Car

from 6:30 a.m. until 8:30 p.m. The last car leaves Fort Worth at 11 p.m. and Cleburne at 10:30 p.m. Extra short stop service is furnished morning and evening operating as far as Burleson.

As yet these cars have not been on a sufficient length of time to tell what the result will be on increasing earnings, but it is the confident opinion, based on the many favorable expressions so far received and results from a similar experiment on the Dallas Division and city lines, that a material increase in gross may be expected.

Threefold Problem of Electric Railway Safety

SAFETY on electric railways has a threefold nature. This is because of measures necessary to safeguard employees, passengers and the general public, according to an article by John W. Oliver, safety engineer Chicago, North Shore & Milwaukee Railroad, in the July issue of *National Safety News*. In this article Mr. Oliver tells about the safety organization on this railroad with its system for training men in safety methods, obtaining ideas for improvements in the direction of safety and bringing safety before the public. The author emphasizes particularly the great advantage of teaching safety to children and points out that many talks to young listeners are very much over their heads. He says that when he visits a kindergarten group, he does not stand before the class and attempt an oration. He usually sits on the floor with the children and plays with them. At the same time he tells some little story about safety or how the children should conduct themselves on the street, in the playground and at home.

Pittsburgh Railways Has a Big Brass Band

LISTENING to the big brass band of the Pittsburgh Railways is a real treat. The band, composed solely of employees from the several departments of the company, was organized in September, 1925. Since then it has appeared at several company functions, such as new carhouse openings and evening entertainments of the company's employees. The band has also played before outside organizations, such as the Joint Safety Meeting and the Civic Club of Allegheny County Flower Show.

Only the leader, Alois Hyabak, is an outside musician, and he has been eminently successful in organizing the 40 members. Employee members are compensated by the company for all lost time attending rehearsals, and when they play for outside engagements they receive regular musicians' rates. The company has high hopes that this band will develop into one of the best, and it is already an important factor in the company's publicity and public relations work.



Pittsburgh Railways 40-Piece Band Is Composed Solely of Company Employees Except the Director. The Men Have Trained Diligently Since the Organization of the Band in September, 1925

Advantages of the Indeterminate Permit

Experience Shows that It Is Equally Desirable for Utility and Public and Far Superior to the Fixed Term Franchise—
Legal Decisions Have Clarified Its Status During Recent Years

By Oscar L. Pond, LL.B., Ph.D.*

Attorney, Indianapolis, Ind.

THE principle of the continuous franchise or indeterminate permit is of the greatest importance in our modern system of commission control of public utilities. The franchise or permit, under which the public utility serves the public, is the basis of the relation and determines fundamentally the rights and duties of all interested parties. The nature of the service, the conditions under which it is given and its extent or the period of its duration are all fixed and determined by the franchise. As the franchise is the foundation of commission control, the principle established by the use of the indeterminate permit makes for uniformity in practice and places all utilities under the same method of control and on a common plane of regulation.⁽¹⁾ The National Association of Railway and Utilities Commissioners in its 34th annual convention resolved that the principle of the indeterminate permit is economic and sound and recommended its adoption in each state.

Prior to the establishment of our modern public utility commissions, franchises in most states were granted for fixed and definite periods as the only means then available of controlling public utilities, including their rates and service. As the acceptance of such a franchise by the public utility constituted a contract, the privilege of occupying the streets and other public places for the purpose of rendering the service and the rates and other conditions of service were generally provided by the terms of the franchise. During the period fixed by the franchise, these conditions could not be modified, eliminated or supplemented to meet new conditions or changed relations, which are constantly arising in the fields of industry and finance with new inventions and improved methods of business.⁽²⁾

Under this old plan of granting franchises for a limited time or a definite period, on the expiration of the term, the franchise rights terminated the contractual relation created by it, so that neither party could be compelled to renew it nor required to furnish or accept service thereafter. The right of the utility, which had furnished the service, to remove its equipment was clear and unquestioned, although its exercise involved an extravagant waste of property due to its depreciation on such removal, as well as the consequent expense of repairing and repaving the streets. Under

such conditions, plant and going-concern values were reduced to mere junk, or whatever the tangible property would bring after being dismantled and removed from the field of service.

At the same time the service was interrupted or discontinued and the consumer suffered the consequences. As all this inconvenience and loss of service and investment must be borne by the consumer, because it is necessarily charged to the cost of service by the utility rendering it, the interest of the public as well as the utility naturally demands that it be avoided by the continued use of the plant, which can be most surely and advantageously secured under the continuous franchise that is sometimes aptly described as the indeterminate permit.

INVESTMENT CONSERVED BY CONTINUOUS FRANCHISE

The necessity and advantage of conserving these investments by some form of uninterrupted franchise, and the practical effect of a failure to do so under the old form of granting these rights for fixed periods, is very well illustrated in the case of *Denver vs. New York Trust Company*,⁽³⁾ which decided that on the expiration of the twenty-year period of the franchise all rights to the use of the streets terminated, and although the municipality might have renewed the franchise or purchased the plant, it was not obliged to do so, for as the court said: "In the absence of some stipulation to that end, the city would be under no obligation to purchase or renew, nor would it be entitled to do either."

In *Detroit vs. Detroit United Railway Company*⁽⁴⁾ the Supreme Court of Michigan held that the contractual relations between a municipality and a street railway to which it had granted a franchise terminated upon the expiration of the franchise period, and that all rights of the company to occupy the streets and to maintain and operate its street railway system thereon ceased, so that the city had the absolute and unquestioned right at any time thereafter to compel the company to vacate the streets and to remove its property therefrom. This decision was upheld by the Supreme Court of the United States.⁽⁵⁾

By virtue of the continuous franchise or indeterminate permit, the utility secures the right to operate exclusively and continuously under the regulation and control of the commission so long as the service is sufficient and satisfactory, and subject at all times to rate regulations and adjustments to meet changing condi-

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¹*LaCrosse vs. LaCrosse Gas & Electric Light Company*, 145 Wis. 408; 130 N. W. 530. *Winfield vs. Public Service Commission*, 187 Ind. 53; 118 N.E. 531; P.U.R. 1918 B 747.

²Pond, *Public Utilities*, 3rd. Ed., Sec. 120 et seq. and cases cited.

³229 U. S. 123; 57 L. Ed. 1101.

⁴172 Mich. 136; 137 N. W. 645.

⁵229 U. S. 39; 57 L. Ed. 1056; Pond, *Public Utilities*, 3rd. Ed., Sec. 449 and 473 to 478.

tions.⁽⁶⁾ This plan obviates needless controversies which are expensive and tend to impair the service, the credit of the utility and the value of its securities, and which ultimately result in higher rates and interrupted and unsatisfactory service, as has frequently occurred on the expiration of fixed-term franchises.⁽⁷⁾

Continuing franchise rights are essential to the best results which can only be obtained under a policy of constant and consistent regulation of a continuous, sustained service, based on permanent investments and on a scale of operating costs which are in the interest of economy and efficiency. This plan serves and protects the interests of all parties concerned. The consumer secures adequate and satisfactory service at fair and uniform rates; the utility can obtain the most favorable terms of financing, and is justified in making extensions and improvements promptly and permanently, and in keeping the plant in a high state of efficiency at all times; and the investment can only be terminated by the policy of municipal ownership at the fair value of the property, actually used and useful for the service of the public.⁽⁸⁾ The expense and political activity which formerly too often attended the securing or renewing of franchises are entirely eliminated by the permanency of the indeterminate permit.

Regulated and uninterrupted service during good behavior, when given exclusively by a single utility, is to be preferred to the regulation which competition cannot give, and to franchise regulations for fixed periods of duration under the former practice which obtained before the establishment of our present plan of commission control. The service which is now afforded under this more modern plan of control is, of course, always subject to the reserved right of the commission to grant similar permits to others where convenience and necessity may require and justify it, and subject also to the right of the municipality to purchase the plant.⁽⁹⁾ In this way, investments and service are not periodically disturbed by the interruptions of service and the fluctuations in the values of securities, consequent on the expiration of franchises; and the financial policy of amortizing the investment over the franchise period, which was formerly attempted, is now entirely obviated.⁽¹⁰⁾

With the right to serve continuing indefinitely and being exclusive, at least so long as the service is satisfactory and sufficient, investments in plant and equipment are made permanently and much more substantially and on better terms, and are maintained at a higher level of efficiency because they are recognized as being permanent and secure. This has the effect of stabilizing investments for the investor as well as for the utility, which in turn effects economies for the benefit of all interested parties, including the consumer.⁽¹¹⁾

ELASTIC REGULATION PERMITTED

Regulation under this plan is the most elastic possible, for it is currently available at all times because

the permit may be revoked for cause or terminated by municipal ownership if found necessary, in contrast to the arbitrary and fixed franchise, which precludes the fullest control during its term and tends to unsettle the relations of all parties at its termination. The plan provides an uninterrupted service and conserves the necessary investments under continuous regulation and control; and in this way avoids arbitrarily discontinuing or disturbing necessary service and investments to the loss and inconvenience of all parties, which frequently arose under the former plan of granting franchises for fixed periods.⁽¹²⁾

Under this later form of franchise, the indeterminate permit, the public utility commission determines in the first instance whether public convenience and necessity demand the utility service when such a company proposes to install its plant and furnish its service, and only after a determination of this question in the affirmative and the granting of the permit by the commission may the plant be installed and the service furnished. This plan avoids needless competition by the legalizing of a monopoly of service. The condition or consideration, however, for the granting of such a permit and exclusive service privilege is that the utility securing it shall be constantly and completely under the regulation and control of the state through its public utility commission and that the utility shall furnish adequate and satisfactory service at reasonable rates.⁽¹³⁾

Public utilities, operating under the indeterminate permit, are in the best position to render continuous service at uniformly economical rates, and to sustain their investments and maintain their credit to advantage, because their service is uninterrupted and exclusive. Under this plan, the utility is protected against competition and a possible loss of its plant investments, which might occur on the expiration or forfeiture of its franchise when granted for a fixed period, in the event of a failure to secure a renewal of its franchise or the sale of its plant as a going concern.⁽¹⁴⁾

LEGALLY SOUND AND ECONOMICALLY ADVANTAGEOUS

Experience shows that under this plan, so long as proper service is given at reasonable rates, competition is seldom, if ever, encountered and municipal ownership, which is always available legally, is unnecessary and practically unknown in fact. The plan has become popular in practice and wherever adopted it seems to be equally satisfactory to all concerned. It is sound legally and economically and has demonstrated its advantages in practice far beyond any other established system for the regulation and control of public utilities. While its acceptance has of necessity been voluntary, in each case it has been received with favor, and practical experience has demonstrated its advantages and justified its permanent establishment as the best and most advanced method of commission control. It is generally regarded as an integral and essential feature of the later and most advanced systems for the regulation and control of public utilities; and it is certainly one of the most fundamental and valuable features now available for this purpose, and constitutes the most

⁶Evansville Street Railways Company, In Re, P.U.R. 1918 D 685. Gary & Interurban Railroad Company, In Re, P.U.R. 1918 A 88.

⁷Calumet Service Company vs. Chilton, 148 Wis. 334; 135 N.W. 131.

⁸Citizens Gas Company, In Re, P.U.R. 1922 B 440.

⁹Brookville vs. Brookville Electric Company, P.U.R. 1922 D 1. Oshkosh Water Works Company vs. Railroad Commission, 161 Wis. 122; 152 N.W. 859; L.R.A. 1916 F 592; P.U.R. 1915 D 336.

¹⁰Connell vs. Kaukauna, 164 Wis. 471; 159 N.W. 927; 160 N.W. 1035; An. Cas. 1918 A 247.

¹¹Fresno Traction Company, In Re, P.U.R. 1922 E 341.

¹²Los Angeles Railway Company, In Re, P.U.R. 1922 A 66.

¹³Arkansas Light & Power Company, In Re, P.U.R. 1920 D 775. Farmers & Merchants Co-operative Telephone Company vs. Boswell Telephone Company, 187 Ind. 371; 119 N.E. 513; P.U.R. 1918 E 172.

¹⁴Appleton Water Works Company, In Re, 6 W.R.C. 97.

unique and comprehensive method known for realizing to the fullest extent the advantages of commission control of public utilities.⁽¹⁵⁾

The courts have recognized this principle as being legally sound and economically advantageous ever since its establishment in practice. Its practical effect is very well indicated in the leading case of *State ex rel. Kenosha Gas & Electric Company vs. Kenosha Electric Railway Company*,⁽¹⁶⁾ decided in 1911, in which the court defined the purpose and effect of the indeterminate permit as follows: "The public utility law in form in unmistakable terms disabled the city of Kenosha from making such a grant as that in question after respondent's indeterminate permit took effect. . . . The intent was to give the holder of an indeterminate permit, within the scope thereof, a monopoly so long as the convenience and necessities of the public should be reasonably satisfied, yet to secure to the public the benefit of the monopoly in excess of a fair return upon the investment, under proper administration, by insuring to the consumers the best practicable service at the lowest practicable cost and to that end prohibit, conditionally, the granting of just such franchises as the one challenged in this case."

One of the best arguments for public utility commissions and the indeterminate permit, as an integral feature of this plan of control, is furnished in the case of *Calumet Service Company vs. Chilton*,⁽¹⁷⁾ decided in 1912, where the court says: "The findings are to the effect that only the privilege feature of the old franchise survived the surrender for its equivalent emanating directly from the state; that all the conditions and limitations of the old and all contract features between the city and the owners of the privilege inherent in the grant were extinguished by the surrender and superseded by the 'conditions and limitations' of the public utility law. . . . In other words, the idea is that the grantee, under state control, and subject to prescribed limitations and supervision, shall have a 'monopoly,' as it has been several times called by the railroad commission, in its administrative work and by this court, within the field covered by the privilege, as to rendering the particular public utility service, whether directly or indirectly, to or for the public.

"We should say, in passing, that the term 'monopoly' as thus used is to be taken in the sense of a mere exclusive privilege granted for a consideration equivalent; monopoly only in the sense that the field of activity is reserved to the grantee—the mere element of exclusiveness. . . . The evident intention of the Legislature, expressed in unambiguous language, when read in the light of the situation dealt with, was . . . to substitute a new situation, all looking to unity in practical effect of a multitude of diverse units corresponding to the many outstanding franchises, and others in prospect, harmonizing them by making them referable to a single standard, to wit, the public utility law, and to a single control, to wit, control by the trained, impartial state commission, so as to effect the one supreme purpose, i.e., the best service practicable at reasonable cost to consumers in all cases and as near a uniform rate for service as varying circumstances and conditions would permit—a condition as near the ideal probably as could be attained."

Such is the chief purpose and effect of the indeterminate permit as defined by the court in its practical application, and such is the opinion of the Supreme Court of Wisconsin where this plan of control has been in constant use since 1907. During all that time, however, the commission has never found it necessary to authorize the operation of a competing utility in any city, although competition is made available at all times for the protection of the public interests and to supply the public needs at any time that the existing utility fails to serve the public adequately and at reasonable rates.

BETTER SERVICE POSSIBLE

This plan in granting an exclusive privilege to serve a given community during good behavior, or so long as the service is satisfactory and sufficient, guarantees the public the best possible service at the lowest practicable cost, as fixed and determined by the impartial commission of trained experts of the state whose findings are based on wide experience and uniform practice in regulating the same or similar forms of franchise rights. Under this form of a continuing franchise, investments are secure in their right to a fair return during good behavior and to a fair price for the plant on its purchase by the municipality on such terms and conditions as the commission finds just and right.⁽¹⁸⁾

In relieving the utility of the risk of competition and of the possible loss of its investment on the expiration or forfeiture of its franchise, its investments are conserved and can be financed to better purpose, and this operates to the advantage of all parties. By requiring uniform rates and discontinuing discriminations in the form of free service, which commonly prevailed under the old franchises, the utility can serve the public better and at lower rates and also finance its operations to better advantage. This plan provides continuous regulation and control of rates and service and avoids the bargaining for franchises and the constant uncertainty and continued interruption of service and policies commonly prevailing under fixed-term franchises. It also lodges the control in the hands of an experienced, disinterested commission of trained experts representing the entire state.⁽¹⁹⁾ It makes for uniformity in the regulation of rates as well as standards of service and promotes a spirit of co-operation between the utility and the public because of the uniformity of rates, service and treatment as a continuous policy.⁽²⁰⁾

The public interests are not conserved, nor can those of the utility be, by the policy of the fixed-term franchise, which serves as a constant reminder that on the expiration of the franchise, for any or for no reason, the utility may be denied the right to continue to serve advantageously or at all, and be thus required to dispose of its plant and equipment as junk or at any price obtainable by a trespasser or one having no further right to use it as designed. Such a risk is wholly unjustifiable and may be avoided by the policy of a continuous franchise in the interest of all parties, and in this way capital can be secured to the best advantage because of the permanency and security of its investment. Service to the public is assured, which can be made adequate and continuous and at the lowest possible cost to the advantage of all parties. Such cannot

¹⁵*Calumet Service Company vs. Chilton*, 148 Wis. 334; 135 N.W. 131.

¹⁶145 Wis. 337; 129 N.W. 600.

¹⁷148 Wis. 334; 135 N.W. 131.

¹⁸*Waukesha Gas & Electric Company vs. Wisconsin Railroad Commission*, 181 Wis. 281; 194 N.W. 846; P.U.R. 1923 E 634.

¹⁹*Fort Smith Light & Traction Company, In Re*, P.U.R. 1920C 418. *Indiana Fuel & Light Company, In Re*, P.U.R. 1918 B 762.

²⁰*Washburn vs. Washburn Water Works Company*, 6 W.R.C. 74.

be the case where competition exists or threatens and where the entire plant investment is subject to the risk of a discontinued service on the expiration of a fixed-period franchise.⁽²¹⁾

Under the indeterminate permit, the owners or the investors in the public utility plant are assured of a reasonable return on their investment and the continuance of their business on such terms, so long as its service proves adequate, without the risk and interference of competition, and subject only to the right of the municipality to purchase the plant at its just value so far as it is used and useful for the convenience of the public and on such terms and conditions as may be determined by the commission.⁽²²⁾ Those who have observed the practical effect of this continuous franchise plan of regulation in the form of indeterminate permits are generally agreed on its desirability from the standpoint of the utility and the investor in its securities as well as the patron and the public at large. It bids fair to become universal in practice as its advantages are demonstrated and its merits discovered.⁽²³⁾

EFFECT OF ACCEPTANCE OF INDETERMINATE PERMIT

The acceptance of an indeterminate permit in lieu of an existing franchise for a fixed period is of necessity voluntary, for as the Supreme Court of the United States held in the case of *Superior Water, Light & Power Company vs. Superior*:⁽²⁴⁾ "The integrity of contracts—matter of high public concern—is guaranteed against action like that here disclosed by Section 10, Article I of the Federal Constitution: 'No state shall . . . pass any . . . law impairing the obligation of contracts.' It was beyond the competency of the Legislature to substitute an indeterminate permit for rights acquired under a very clear contract."

Nor can the state after the granting of an indeterminate permit subject the holder thereof to additional burdens or obligations inconsistent therewith.⁽²⁵⁾ The utility cannot be required to render free service or to discriminate in its rates, because this would be in violation of its contract after the granting of such a permit, although the old franchise so provided. As the court held in *Greensburg Water Company vs. Lewis*,⁽²⁶⁾ "On June 30, 1917, appellant accepted the proposal of the state by surrendering its franchise in accordance with the provisions of the act. By this acceptance the minds of the parties met and agreed on the terms of the proposal embodied in the act, and a contract was thereby concluded between the state and the appellant whereby all the terms, conditions and provisions of the existing franchise agreement were abrogated and rescinded. The state was a party to the franchise agreement which the city of Greensburg made with appellant, acting for the state under delegated authority. Later the state, acting directly through its Legislature in making the proposal and through its Public Service Commission, on which it had conferred express authority in the

premises, entered into a contract with appellant by the terms of which such franchise agreement was abrogated and rescinded in toto as to both parties. By the italicized part of the act quoted (Acts 1919, P. 709) the state attempted to violate the obligations of a contract made with appellant by the force of which the franchise contract had been abrogated in all its terms as to both parties. The act attempts to revivify and re-establish some of the terms of the abrogated contract which were burdensome on appellant and to enforce such terms against appellant without its consent. That part of the act, if enforced, would clearly impair the obligations of contracts, and for the reason stated it must be held to be void as in conflict with the sections of the Constitution heretofore quoted."

In sustaining this same principle and denying validity to an ordinance which attempted to require the utility to pave between and alongside its tracks the commission in the case of *Indianapolis Street Railway versus Indianapolis*⁽²⁷⁾ said: "To determine this question [of the liability to pave between tracks], we must ascertain the effect of the surrender by the petitioner of its franchises with the city of Indianapolis and the acceptance of the indeterminate permit as provided by law in lieu of the franchises so surrendered. . . . The state having thus induced the petitioner to surrender its franchises and having entered into a new contract whereby the petitioner was relieved from its paving obligations, under the requirement of the franchises surrendered, it would seem unjust, unreasonable and inconsistent to permit the city as the agent of the state, without consideration or petitioner's consent, to reimpose the burdens from which petitioner had been relieved."

RESULTS MUTUALLY ADVANTAGEOUS

That the advantages of the indeterminate permit are fully recognized and enjoyed in California is indicated in the case of *Los Angeles Railway*,⁽²⁸⁾ where the California commission says: "The best solution, from the point of view of both the city and the company, would seem to be the acceptance by both parties of a form of so-called indeterminate resettlement franchise. Such a franchise can be drawn to protect properly all parties and interests. . . . In the absence of an adequate franchise, the further street car development must lag and service must suffer."

And in the *Fresno Traction* case⁽²⁹⁾ this same commission says: "This commission has on several occasions expressed its opinion of the desirability, from the standpoint of the public, of exchanging obsolete and undesirable term franchises for more desirable and more modern indeterminate franchises. . . . From the standpoint of the company's bondholders, the franchise exchange is a desirable step and one tending to enhance the value of the security."

In *re Davis*,⁽³⁰⁾ the commission of Minnesota refused to issue an indeterminate permit to a proposed competing company to operate in the same field with an existing company holding such a permit, because public convenience and necessity did not justify or demand such competitive service.

In *Fort Smith Light & Traction Company*,⁽³¹⁾ the

²¹*Appleton vs. Appleton Water Works Company*, 5 W.R.C. 215.

²²*Brookville vs. Brookville Electric Company*, In Re, P.U.R. 1922 D 1. *Cashton Light & Power Company*, In Re, 3 W.R.C. 67.

²³*Farmers & Merchants Co-operative Telephone Company vs. Boswell Telephone Company*, 187 Ind. 371; 119 N.E. 513; P.U.R. 1918 E 172.

²⁴263 U. S. 125; 68 L. Ed. 204.

²⁵*Indianapolis Street Railway Company vs. Indianapolis*, P.U.R. 1922 E 545.

²⁶189 Ind. 439; 128 N.E. 103; P.U.R. 1921 A 96. On June 1, 1926, the Indiana Supreme Court in *Chicago, Lake Shore & South Bend Railway vs. Gulfcoyle* fully sustained its former decisions on the effect of the acceptance of an indeterminate permit and extended this effect to include a total abrogation of the former franchise provisions.

²⁷P.U.R. 1922 E 545.

²⁸P.U.R. 1922 A 66.

²⁹P.U.R. 1922 E 341.

³⁰P.U.R. 1918 F 406.

³¹P.U.R. 1920 C. 418.

commission of Arkansas in sustaining this policy said: "The chancellor also held that the obligations of the contract are not impaired by the surrender of the franchise as provided in Section 15 of said act." The Supreme Court of this same state in the case of *Arkansas Natural Gas Company vs. Norton Company*⁽³²⁾ decided in 1924, said: "Section 15 of this act provides, in effect, that contracts, franchise and leases may be restored to utilities operating under indeterminate permits upon application made by such public utility corporation in the manner provided in the act."

This case defines the rule prohibiting discrimination by public utilities and serves as an excellent illustration of the advantages of uniformity in rates and standards of service, which is more fully and easily secured by virtue of the indeterminate permit. Under this system of control all franchise agreements are made on the same plan and for like periods, which tend to simplify the regulation and to secure uniformity and continuity in the operation of public utilities and places their investments on a secure and permanent basis, which permits of an improved, sustained service at a reduced cost.

Co-operation to Relieve Street Congestion in Philadelphia

EFFORTS are being made by the Philadelphia Rapid Transit Company, in co-operation with the Philadelphia Department of Public Safety, toward the alleviation of traffic congestion in that city. The Sesqui-Centennial Exposition in the Quaker City has brought with it a severe strain on the city's traffic facilities, with Broad Street, the main traffic artery to the exposition grounds, bearing the brunt of the congestion. This street, with its southern end terminating at the exposition gates, carries a great percentage of the north and south traffic.

Practically all the outside motorists and many of those living in the city use this thoroughfare and on certain days Broad Street has been choked with cars and buses. The resulting traffic jam taxed the ingenuity of the police to the utmost.

Fearing the condition would become chronic, the city, at the instigation of the Mayor and the Department of Public Safety, has, with the co-operation of the Philadelphia Rapid Transit Company's traffic engineers, formulated a plan which will relieve congestion in the center of the city. Motorists are encouraged to make use of numerous wide and well paved streets which parallel Broad Street or run at a slight angle with it, and which at the present time are often neglected by the outside motorist.

Metal arrows bearing the inscription "To Sesqui" have been placed on poles along the designated routes. The city police are distributing 100,000 pamphlets with maps to all incoming motorists, describing these routes, and the automobile clubs of the city are distributing thousands more. Every effort will be made to divert traffic along the routes as planned.

Such measures permit a steady flow of traffic and enable the motorist to make better time than by the use of Broad Street. Incidentally the occasion cited offers a splendid example of the opportunities which exist for co-operation between a municipality and its public utility.

Advertising Campaign Stimulated

Fort Smith Light & Traction Company Conducts Contest for a Name or Slogan to Head Its Advertising Space in Local Press

WHEN the railway management at Fort Smith, Ark., was confronted recently with the proverbial query "What's in a name?" its response was "Community Progress." Under this name through the newspaper medium the Fort Smith Light & Traction Company is appearing twice each week with items of community interest linked up with the utility service.

The preparation for the railway's newspaper début under the name of "Community Progress" was started early in the present year when a public relations department was organized under the management of R. C. Coffy. In addition to the usual functions looking toward the promotion of good will the department also has charge of the advertising of the company. In the past this advertising was handled from the Oklahoma City office, but it was decided that not only would the type of advertising be changed but that the material would have more local interest if produced by some one in closer touch with the particular territory.

A space of 30 in., two columns, was being used in Fort Smith, and the plan was to use this space as a tabloid newspaper running local items written so that the company's business would be brought into it. The first problem was a name for the tabloid, and it was decided to offer a prize for the best name suggested by the public or the employees.

The first "ad" was inserted on March 9, with the heading "Five Dollars for a Name." The 30-in. space was used twice weekly until March 31, copy being changed each issue. In order that those submitting names might have some assistance or ideas of what was wanted in the form of a name, the company wrote several "Locals" as samples of what the column would contain. In the space it was also brought out that the service rendered was threefold—gas, electricity and railway. This hint brought out many coined and group words which carried out the three-service idea.

The results were very encouraging and surprising. In all 374 names were sent in without any indication of levity, sarcasm or "smart aleckism." Rather did the company receive many favorable personal comments on the advertising copy.

In deciding upon a name a list of suggestions was given to the departmental heads to choose the ten which, in their opinion, were best. The opinions all simmered to one, but after it was chosen it was found that a certain utility company was using one very much like it. This made it unavailable and the title "Community Progress" was chosen.

No one actually suggested the name "Community Progress," but four suggested "Progress," and that being half of the name decided upon all four people were sent one-half of the prize amount offered.

In one of its advertisements the company sums up the plan:

"What is our aim? Progress. How significant, then, is 'Community Progress' as a title for this space. We will try and tell you what progress is being made in our community."

³²165 Ark. 172; 263 S.W. 775; P.U.R. 1924 E 675.

Women, Too, Can Help Make Friends for the Railway

A Story of How a Woman Is Gaining Friends for the New Orleans Public Service Through Contact with the School Children of That City—The Public Service Idea Naturally Gets Into the Home Through Intimate Channels Barred to Other Approaches

By Julie Paillet

New Orleans Public Service, Inc., New Orleans, La.

EDITOR'S NOTE

Without doubt the light and power utilities have used the women of their companies to a far greater extent than railway companies as an aid to promote public relations work. At the last joint convention of the Southwestern Public Service Association and the Southwestern Geographic Division of the N.E.L.A., held at Galveston, Tex., Miss Paillet gave a talk on "A Recent Development," describing this important work in New Orleans. The present article has been written by the author to show how she applies "open house" to the railway operations of her company.

IN 1921, when broad-visioned utility executives of the National Electric Light Association inaugurated the women's public information committee, little did they realize what an important rôle the women could play in the great task of establishing better public relations.

Women in a number of companies are tactfully working their way into the clubs, civic organizations and schools. The work in the schools, however, is the most recent development. In a few localities "open house weeks" have been fostered by various utility companies. Fortunately, just about the time our company was seriously considering developing this plan, the city launched a mammoth publicity campaign, and there was the golden opportunity, for the Mayor issued a call for speakers who were familiar with all phases of the city's life—commercial, social, historical and otherwise. Our president pledged the services of our company and several employees were selected to speak for the cause. Although it had been quite a few years since I'd heard the old school bell ringing and I was rather unpolished

on my historical and geographic facts, I collected quite a few facts and figures on "America's most interesting city" and gave my first talk before the principals of the public schools. After that there were numerous school engagements to fill. Then another civic campaign was fostered—"Fire Prevention Week." Again I helped and spoke in several schools, besides acting in a motion picture film on this subject, which was given much publicity in the schools.

The early part of this year we received permission from the superintendent of schools to appear before classes in the interests of the company. Attractive invitations were sent to all the public, parochial and private schools, inviting them to visit our various plants and assuring them that the New Orleans Public Service, Inc., was ever eager to promote educational projects. We further stated that we would transport the pupils to and from the schools in our up-to-date buses, and assured them that it was our earnest desire to serve them.

In the interim I visited each of the plants with the superintendents, outlined the routes, appointed capable guides and learned quite a bit about the various technicalities, for I fully realized that the pupils would expect me to answer their numerous questions.

A few days after issuing these invitations the response from the schools was beyond all expectations. There were letters galore, and the phone refused to stop ringing. On March 10 this campaign for publicity was officially launched and it was not completed until May 14. In the early part of the campaign we made a trip each day, but the schedule soon became so heavy that it was necessary to make two trips a day and it



School Children on Visit to Carhouse of New Orleans Public Service, Inc.

continued the rest of the school year. Think of it, every day our company makes an average of about 75 new friends, and it is needless to say that these pupils carry the message home, and what parent will not listen to his own child. The teachers and principals, too, become our friends and we *do* know the amount of influence they can exert.

In handling these trips we go to the schools with buses and I first give the pupils a talk on the policy of the company and tell them what they are going to see on the trip. Then they are taken to the main power house, known as our Market Street generating station;

and if the lights burn, then, of course, he knows that the line is supplied with current. He then looks for trouble in his controller by trying that out and pretty soon finds out what is wrong and goes merrily on his way.

Of course, this all goes to prove to the pupils that this avoids unnecessary tie-ups on the line which would inconvenience the passengers. They are also told that the trainmen need from fourteen to eighteen days to go through this course of instruction, and after they pass a final oral examination they are assigned to their respective divisions and become subject to discipline through the supervisors, station masters, division superintendents and, finally, the superintendent of transportation. For a period of 60 days the men are under probation, however, and after this time is half over they return to the school and must pass a final written examination, consisting of 81 questions for the motormen and 79 questions for the conductors. The thing that seems to impress the children most is the fact that our men have safety contests. Prior to the year 1924 we were reporting 25 or 30 accidents per day, and since we have inaugurated our safety contests our accidents have been reduced to about fourteen per day. We have five divisions in the system and there is a continual friendly rivalry between the men of the different divisions to turn in the lowest per cent of accidents. These per cents are calculated daily and the division having the least number of accidents hoists a pennant in front of its division headquarters the following day; besides this, a monthly



Showing the Children How the Electrical Equipment Works

the gas plant, and the training school for motormen and conductors. They are encouraged to ask questions that arouse their interest, and most classes take unusual notice of essential features during the entire trip and write essays afterward.

The pupils are told that the main power house has a generating capacity of 85,500 kw., and to help them visualize this they are asked to imagine 110,000 wild horses all trained and harnessed to serve them. At the gas plant I explain to them about the generator, carburetor and superheater; how the condenser system cools the gas; how the meters are tested and proved for the customer's protection, as well as the company's, and that on a cold day it is necessary that we use 250 tons of coke and 75,000 gal. of oil in order to meet the needs of the city.

At the training school it is explained that there are only two troubles that can happen to an electric circuit—an open circuit or a ground, and that the motorman is taught to locate the trouble by following a regular process. To start with, he determines whether or not the trouble is on the lines by turning on his lights,

report is kept, and the division reporting the least number of accidents for the month is awarded a pennant, which it is allowed to keep for another month, or until such time as another division may turn in a better record; also, based on the monthly report, each member of the winning division is given a gold button with the picture of a street car on it. Most naturally a plan such as this is of mutual benefit, for the general public is benefited as well as the company.

BUSES USED TO TRANSPORT VISITORS

From the training school the pupils are transported back to their schools in the buses, or are let off at convenient corners. At the same time they are impressed with the idea that this is just "another public service." By the time the trip is ended the pupils enthusiastically cheer the company, and it goes without saying that all the people in the immediate vicinity are well aware that the New Orleans Public Service is on the map. After the school children have made this trip I challenge anybody to say anything but commendatory remarks about us to these pupils.

Maintenance Notes

Improving Appearance of Platform Equipment

PIPING underneath motorman's air brake valves and the space back of controllers is being incased on cars of the Department of Street Railways, Detroit, Mich. The casings, which are made of No. 20 gage



A Sheet-Iron Casing Over the Piping for Air Brake Valves and Inclosure for the Space Behind the Controllers Improve Platform Appearance of Cars in Detroit

sheet steel, improve the appearance of the platform equipment considerably. Handles of air valves are arranged to extend outside the casings so that they can be operated readily. The casings extend entirely to the floor and are painted so as to correspond with the general decorative scheme of the cars.



At Left, Assembled Bearing and One-Half of Housing. At Right, Detail Parts. Slot Holds Bearing in Place

By closing in the ordinary space back of the controllers, accumulations of refuse, papers, etc., are prevented, as is also the tendency of motormen to use these spaces as cuspidors. The railway officials plan to incorporate this improvement on all of the cars.

Armature Assembly Prevents End Play

IN ORDER to hold the armature bearing flanges tight against the housing hubs, as outlined in an article entitled "Compensating Armature Play," which appeared in the May 15 issue of *ELECTRIC RAILWAY JOURNAL*, the International Railway, Buffalo, N. Y., is using a square projection on the housing which fits into a slot sunk into the outside of the armature bearing. This takes the place of dowel pins. Steel washers of any desired number and thickness may be inserted over the armature bearing and, fitting between the flange and the housing hub, eliminate excessive end play.

The accompanying illustrations show the parts with the housing and the slot in the bearing, together with a single steel washer of $\frac{1}{8}$ in. thickness. In the assembled view the bearing is shown as it would be when firmly locked in place with the complete housing applied. Previously round dowel pins on the housing had been used. They did not prove to be entirely satisfactory, as they soon permitted a small amount of radial motion on the part of the bearing. The square projection holds the bearing with a maximum degree of firmness.

Oil and Waste Reclamation in Denver

WASTE reclamation as carried out by a cubical tumbling box on the Denver Tramway system was described in this paper for July 26, 1924. In addition to this reclamation machine an electrically driven centrifugal waste washing machine, a sump and settling tank for preliminary treatment of used car oil extracted from waste, and a centrifugal oil separator, together with drying tables and saturating tanks, make a very complete oil and waste storage and reclamation plant.

The equipment is housed in a separate building of concrete and brick construction. This has one floor and a large basement. By use of the separate building low insurance rates result, due to the minimized fire hazard. The basement of the building is used principally for storage of oil and baled waste. Oil is kept in large welded tanks, each provided with a small receiving tank, from which oil may be elevated by use of compressed air to spigots which are located above the main floor. Supply pipes for the various storage tanks are brought through the wall on one side of the building and are equipped with valves and pipe fittings, so that easy connection to tank cars on an adjacent railway track siding can be made. When connected, oil will flow by gravity from the tank cars to the large basement storage tanks. In unloading heavy oils in winter it is sometimes necessary to heat the oil in the tank cars by means of steam in order to increase its fluidity.

A covered concrete platform is provided at one end of the building. This is on the same level as the building floor, which has a height approximately the same as that from the rail to a box car floor. Waste in bales can then be unloaded from cars directly to this platform with a minimum of labor. From the platform it is lowered into the basement which extends underneath the platform. A large trapdoor is provided for communication to the basement and a jib crane with chain blocks handles

the material. Measuring hand pumps are also provided on the platform. These are connected to the underground storage tanks outside the building, which are used for gasoline and kerosene.

The main floor of the building is used for oil and waste reclamation and for the saturation of waste.

All waste used on the system is transported to and from the oil house in covered cans so as to make certain that it is kept clean. The cans are lettered with the name of the division, the kind of waste; i.e., armature, journal, etc., and also to indicate whether it is new or reclaimed.

To reclaim used waste it is first passed through the cubical box, which combs and pulls out the strands of waste. This shakes out small pieces of babbitt, short strands of waste and other refuse, all of which falls into a pan underneath. The waste is then placed in a centrifugal washing machine, where it is treated with live steam while being revolved at high speed. This extracts the dirty oil. The oil and water resulting from the steam condensation is passed to a sump tank which is located in the floor adjacent to the machine.

After the oil has been extracted the waste is loosened up in a basket of the centrifugal machine. Water and steam are again added and the machine is revolved for some time at a very slow speed in order to wash out any sand and dirty matter from the waste. The sludge which results from this operation is run directly into the sewer. The centrifugal machine is then revolved at high speed in order to extract the water from the cleaned waste. Live steam is admitted during the wringing operation. When all water has been thrown out by centrifugal action the waste is removed from the machine and spread on screen-covered benches under which are steam coils for drying. After the waste is dry it is thoroughly gone over by hand, all knots are removed and the waste is graded as armature or journal waste, according to general condition, length of strands, etc.

The waste is then ready for saturation. Two jacketed tanks are provided for this purpose. The inner tanks contain the lubricating oil to be used. The jackets contain water, which is kept hot by means of steam coils. Heating the oil in this manner materially reduces the time required for proper saturation

of the waste. Formerly waste was handled in and out of the saturating tanks by hand-forking. Later, trays having a two-leaf drop bottom with bails were used. The trays are handled by means of a small chain block supported on a rail running over the saturating tanks. Drain boards provide a means of reducing the labor required in the saturating process. One saturating tank is used for armature waste and one for journal waste. Each tank has its own drain-board and waste-handling tray.

Practically all of the reclaimed oil is used for waste saturation. When there is not sufficient reclaimed oil, new oil is transferred to the saturating tanks from the basement receivers through a pipe line by means of compressed air. This oil is measured at a point near the saturating tanks by means of a Niagara meter. Dirty oil and water from the centrifugal waste machine are held in the sump tank adjacent to the machine until approximately 100 gal. has accumulated. This mixture of oil and water is then heated, given a chemical treatment and is elevated to a conical bottom tank. The treated oil is permitted to settle for a period of approximately 24 hours, during which time it is kept near the boiling temperature by means of steam admitted to a jacket surrounding the conical lower portion of the tank. At the end of the settling period the partially cleared oil is decanted from the settling tank and is then passed through a centrifugal oil separator. The clarified oil, which is of very high quality, is then transferred to the saturating tanks. The sludge remaining in the bottom of the settling tank is discharged directly into a sewer.

A small tank is used for the cleaning of white cotton waste used in the lubrication of older type motors. The method of cleansing is to boil

the waste in an Oakite solution, floating the oil which rises to the surface directly to the sewer. After the waste has been thoroughly washed it is passed through a hand wringer, dried and shaken out before reusing.

The waste washer used was originally designed for turbine drive by means of high-pressure steam. Owing to the fact that this company does not have available high-pressure steam during the summer season, a combination belt and gear drive was developed by means of two pairs of pulleys, one clutch and a 450-1,800-r.p.m. variable speed, $\frac{1}{2}$ -hp. motor with drum controller. Speed regulation is provided over the range necessary for oil extraction and waste washing.

Little Wear on Manganese Steel Plates

SIX points on the trucks of cars operated by the New York, Westchester & Boston Railway have manganese steel wearing plates. These are for the motor-nose supports and for bolster side wearing plates. The motors as originally furnished had a spring type of nose support. The springs were of a laminated construction and some of the leaves broke. In 1915 it was decided to do away with these springs and manganese steel supporting plates were installed in place of the springs. The same two bolts that were used for fastening the springs were used to hold the manganese plates in position.

At the same time manganese steel was installed for the bolster side wearing plates. An accompanying illustration shows a truck with these plates in position, as the truck was brought into the shop for overhauling recently. These plates have now been in service more than eleven years and show very little wear.



Manganese Steel Plates Are Used for Motor-Nose Supports and for Bolster Side Wearing Plates

New Equipment Available

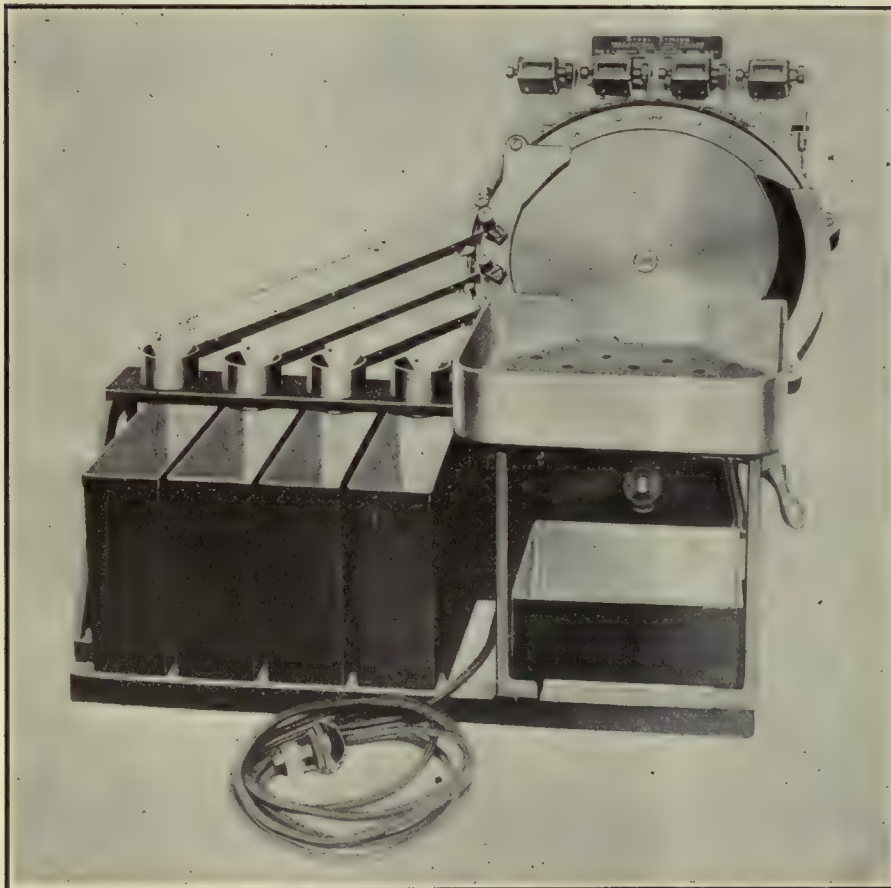
Efficient Machine Counts Coins Electrically

COUNTING and sorting of coins can be done electrically by a machine that has recently been placed on the market by the C. L. Downey Company, Cincinnati, Ohio.

This device, known as the "Steel-Strong" Mechanical Coin Teller, will sort and count pennies, nickels, dimes, quarters and half dollars at the rate of 1,000 coins per minute, it is said. The smaller coins are counted as sorted and dropped in the receiving boxes shown at the left in the illustration; half dollars are dropped in the box below after all other coins are out of the hopper and are counted by hand.

Four coin meters give numerical readings up to 99,999 and may be reset to zero by a single revolution of the reset knob.

Model B-4, shown here, is 19 in. high and occupies a table space 20½ in. x 21 in. A 110 or 220-volt a.c. or d.c. motor is supplied and the total weight is 179 lb.



Front of Coin Counter Showing Cash Boxes and Receiving Tray



View of the Mudge Inspection Car, Showing the Self-Equalizing Brake Equipment

Center Load Inspection Car

OF A weight and design which may be handled easily by one man, a new center load inspection motor car has recently been placed on the market. The car has ample seating space for four men and is designed to provide for a long continuous inspection run. It is manufactured by Mudge & Company, Chicago, Ill., and is known as the Mudge Class B-2 "Inspector."

The car is equipped with a 4-hp. free running motor, the parts of

which are interchangeable with the parts on the motors used in the new light section motor car also manufactured by this company. Transmission is by means of a multiple disk clutch which transmits the power to sprocket on the rear axle by a roller chain. The motor is water cooled with the Mudge thermosymphonic design of water hopper, which permits three times the ordinary cruising radius.

Roller bearings are used in mounting the crankshaft of the engine and also the axles of the car. The whole unit weighs less than 500 lb. with a lifting weight of 140 lb. This light lifting weight is accomplished through the perfect balance of the unit and by the aid of extension lifting handles which are provided on both ends.

Self-equalizing brakes are among the features claimed for the car. No adjustments for wear on the brakes is necessary as they adjust themselves automatically, so that the braking power is always the same on all four wheels. It is also equipped with a unique locking device designed so that when the brakes are set they hold the car in place until released by the operator. No rock or piece of wood is necessary to hold the car while the operator steps aside to do his work. He need only pull back the lever and place it in the notch provided, locking it securely to prevent the car from moving.

The frame is made of kiln-dried selected maple and has sufficient flexibility to withstand twisting in service. The lower longitudinal rail has a metal reinforced plate which facilitates removing the car from the rails and replacing it, acting as a skid.

Association News & Discussions

Southern Equipment Men Meet in Chattanooga

Car Maintenance Practices Were Discussed—Annual Report Shows Progress of Member Companies in Improvement of Pull-In Record and Reduction of Costs of Maintenance

THE Chattanooga meeting of the Electric Railway Association of Equipment Men of the Southern Properties, held July 28 to 30 inclusive, did not lag a minute. The program had many speakers who gave short, snappy talks, and one was no sooner finished than two or three delegates were on the floor with questions or discussions.

According to calculation, the latest group of 60 new cars now being built by the Cincinnati Car Company will save \$210,000 during the first year they are run, was the startling statement of Frank L. Butler, vice-president and general manager of the Georgia Railway & Power Company of Atlanta. This saving in operating costs is practically equal to a quarter of the cost of the new cars. The estimate was based on duplicate cars purchased a year or so ago, the results of which now are a matter of record. Mr. Butler further declared that every schedule in Atlanta can be operated by one man.

E. D. Reed, manager of the Chattanooga district of the Tennessee Electric Power Company, delivered an address of welcome. He also extended an invitation to all delegates to attend a dinner Thursday evening as guests of the Tennessee Electric Power Company.

A. D. McWhorter, general superintendent Memphis Street Railway, presided as president of the association. In his opening address Mr. McWhorter said that the Southern properties con-

A feature of the work of the Electric Railway Association of Equipment Men, Southern Properties, is the record kept of pull-ins and maintenance of equipment costs for the various properties. These figures are charted just prior to each meeting and form a basis for discussion.

While the average miles per pull-in varies from 92,978 down to 2,167, the most remarkable feature of the records is the pronounced improvement made since the organization of the equipment men's association about five years ago.

In 1921 New Orleans Public Service had a pull-in every 2,803 miles. For the entire six months period from January to July, 1926, this company averaged nearly 100,000 miles per pull-in. Nearly as astonishing results are shown for half of the fourteen companies.

Nor is this all. By the expenditure of disproportionate sums of money it might be expected that a pull-in record might be made. From the cost of maintenance chart it is observed that New Orleans, ranking first in the pull-in record, ranks third in the cost, and at that is maintaining its equipment for less than 2 cents a car-mile. Memphis leads in this cost chart with a record of 1.7 cents per car-mile. To a certain extent the answer may be equipment, but methods and organization have contributed to this record.—Eds.

tinued to show greater mileage per pull-in at reduced cost of maintenance. More than 16,000 cars in the country are now operated by one man, and this number is steadily increasing. More than 40 roads have adopted more comfortable seating and more than 300 roads are using bus equipment supplemental to their electric cars.

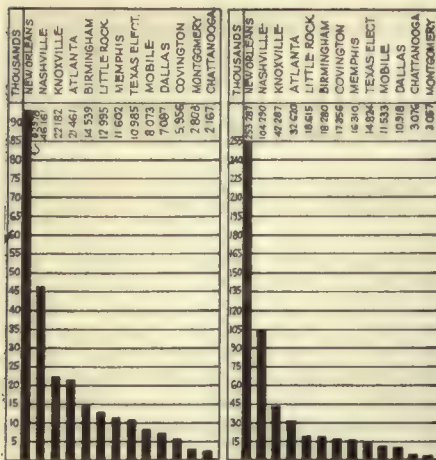
There is a direct connection between public relations and better maintenance, and this duty falls on the maintenance men. People are demanding better service and this calls for better maintenance.

John A. Dewhurst, associate editor ELECTRIC RAILWAY JOURNAL, spoke of the accomplishments of many properties in the North, following successful franchise negotiations and the purchase of new cars. Youngstown, Ohio, was one of the best examples of a rebuilt transportation situation. Many kinds of service are offered by the Pennsylvania-Ohio Electric Company. Three 20-mile interurban lines and 340 miles of coach routes serving Youngstown, a city of 165,000 population, and three small cities have been brought to a paying basis through modern equipment and methods. Pittsburgh Railways are continuing to progress, and Cincinnati is in the middle of a \$1,000,000 track reconstruction program, following the successful passage of a service-at-cost franchise last November.

J. L. Crouse, special railway engineer Westinghouse Electric & Manufacturing Company, told of the steps that manufacturers had taken toward improved maintenance, which, in turn, was an important factor in noise reduction. The dipping and baking of armature coils was one marked improvement that was reflected in a pronounced manner in a 30 per cent decrease in the sales of this class of material. Many improvements in manufacture have re-



Delegates to the Electric Railway Association of Equipment Men, Southern Properties, Meeting at Chattanooga, Tenn., July 28-30, 1926



Progress of Four and One-Half Years Work of Southern Equipment Men's Association in Increasing Miles per Pull-In Shown in This Record for Member Companies. The Chart at the Left Includes Pull-Ins for All Reasons; that at the Right, Pull-Ins for Troubles Connected with the Equipment. The Figures Are for the First Six Months of 1926.

sulted from the experience of operating men.

Dual ventilated motors give promise of reducing brush wear. Much greater brush life can be expected on these motors, due to the elimination of dirt and other foreign material in the dual ventilated motor.

By the adoption of standard sizes in armature bearings and similar equipment, often varying only $\frac{1}{8}$ in. from similar orders from other properties, and the purchase for six months or a year at a time will save at least \$65,000 a year based on a preliminary investigation. The Westinghouse company would be willing to ship such orders on a monthly basis as required, the larger orders, however, allowing economies of manufacture accruing from a mass production basis.

Thorough inspection and repair of armatures, coils, fields, controllers, line breakers, heaters and resistance grids are accomplished once a year in Knoxville, as told by C. A. Walker of the Knoxville Power & Light Company. The average cost of overhauling motors

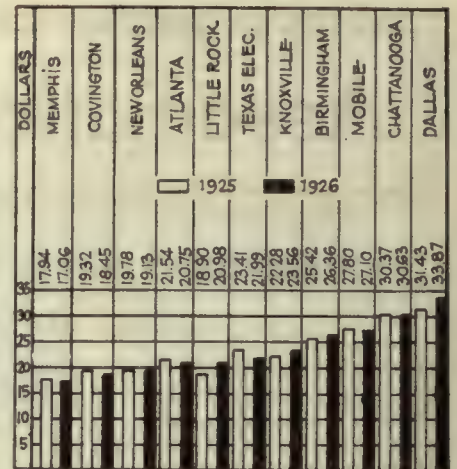
is \$55, circuit breakers \$12, heaters \$1.50 each, air compressors \$12 each and grid resistances \$7 per car set.

J. R. Anderson, superintendent of the Chattanooga Railways division of The Tennessee Electric Power Company, stated that ten cars would be delivered next month from the Light-Weight Noiseless Car Company that would at once be the latest thing in street cars and also the first new equipment to reach the property since 1913. The cars will be double truck, 40 ft. in length, with Kemi-Suede covered seats for 44 passengers. Inside mounted roller bearing journals will be used and 17-in. drums for the automobile type brakes. The painting is a secret not to be divulged until the cars reach the property.

Somewhat aside from the program, Mr. Butler of Atlanta opened a discussion on personnel matters. Educational work, foremen conferences, health examinations, company insurance, all were features under discussion. In Atlanta a foreman's school was conducted last winter and was attended by 83 men, either foremen or superintendents. Of this number, 60 men were present at least 75 per cent of the meetings and passed the course.

The New Orleans Public Service Company operates nineteen buses in conjunction with its railway. An excellent garage has been established, and J. H. Stokes, the foreman, told of the methods of training operators that have been adopted. The maintenance work is well organized. Mr. Stokes presented many forms used and outlined in an able manner the practice adopted to keep this equipment in excellent shape. The methods will have to be good if the buses are to be on a parity with the car equipment record.

James S. Mahan, president Western Section, International Association of Electrical Inspectors, Chicago, gave a very instructive paper on the National Fire Protection Association regulations for car and carhouse equipment. Mr. Mahan pointed out that with the broadened regulations allowed by this association it is possible to comply with all regulations at practically no increased cost for new equipment. Even with



Shows Cost per 1,000 Car-Miles for First Five Months of 1925 and 1926. The Pull-In Record, While Important, Must Be Considered in the Light of Maintenance Costs

old equipment many changes and improvements can be made that will net a splendid return in reduced premiums. Practically all heater manufacturers have agreed to turn out products with the Underwriters' label attached. If the equipment manufactured meets with the approval of the Underwriters' Laboratory the service of supplying approved labels is but a few cents per heater.

With improved car wiring equipment available today the laboratory is now prepared to give an inspection service to car manufacturers and to attach its label to the entire car. This service, including inspection, is nominal, being \$5 per car.

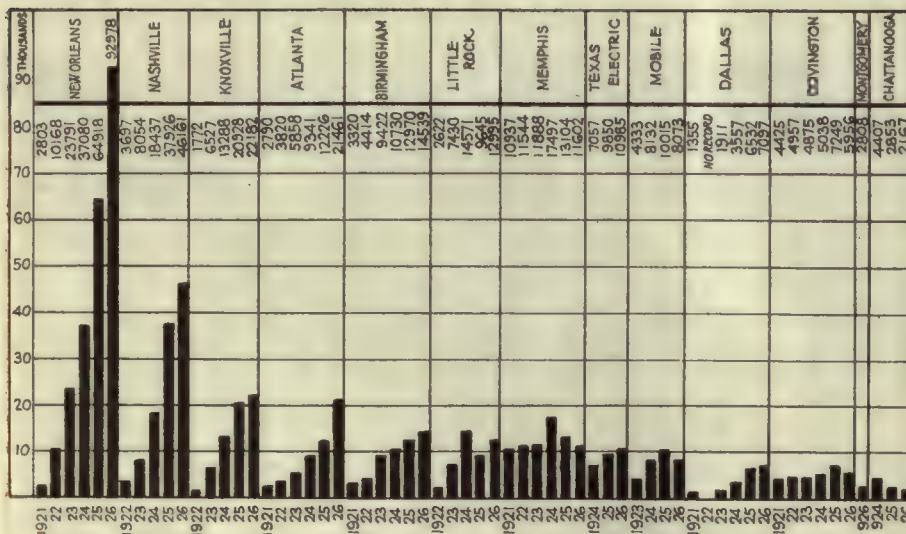
Mr. Mahan pointed out the value of using this service not alone from the saving in premiums but as a factor in establishing public relations as well. Properties could well capitalize the fact that the cars used had passed the Underwriters' Laboratory, Inc., inspection.

In discussion, Mr. Mahan said that the savings in fire insurance premiums would be from \$5 to \$20 annually per car, depending upon the old rate and the method used in determining the schedule. At least \$7.50 to \$10 could be saved each year per car, thus more than paying for the initial service the first year.

Mr. Kasemeyer, Cincinnati Car Company, said that no greater construction costs were involved in complying with this standard than were involved in any good practice. Some of the main points made in Mr. Mahan's paper will appear in a later issue.

D. J. O'Brien, Galena Signal Oil Company, read an interesting paper outlining the Galena theories of oil versus lubrication. Quality of materials and quality of manufacture have a direct bearing on the ability of maintenance men to give good service to the public.

Following Mr. O'Brien's paper, there was a general discussion on oil and waste reclamation. The consensus of opinion was that doubt was cast on the quality of reclaimed oil, but that good results had been obtained on several properties from the scrubbing and cleaning of journal box waste. With the present high price for long fiber wool



This Chart Shows the Relative Pull-In Standard of Member Companies of the Southern Properties Equipment Men's Association. The Figures Are for the Years 1921 to 1925 and for the First Half of 1926

waste, it was considered good practice to reclaim this on properties of sufficient size to warrant the installation of the necessary equipment.

Other papers presented were by F. G. Koenig, E. F. Herndon, W. N. Larissey, Gus C. Kraus and A. Taurman. A summary of Mr. Taurman's paper will appear in a later issue. Abstracts of the other papers appear below.

The entire day of Wednesday, July 29, was spent in a discussion of 50 questions pertaining to equipment maintenance. In the evening the delegates were guests at a dinner tendered by the Tennessee Electric Power Company at the Hotel Patten and on the last day an inspection of the Tennessee Electric Power Company system was made. About 60 delegates attended the meetings.

Some Remarks on Car Troubles*

BY E. F. HERNDON

Foreman Ashby Carbarn, Georgia Railway & Power Company, Atlanta, Ga.

AXLE fields on the split type motor, as we all know, have a field jumper around the axle with a connection in it for the convenience of splitting the motor casing. This jumper hangs under the collar side axle bearing and, consequently, stays oil soaked, which tends to rot and soften the insulation on the wire.

It was the practice in Atlanta to use what we call the knuckle joint connection in this jumper, which is too heavy for this particular place, and allowing the wire to swing with this connection in it is sure to break the strands of wire, reducing its size at this point. Then it is not heavy enough to carry the load and consequently burns in two, and often this jumper burns off flush with the motor casing, giving no chance for temporary repairs.

To get away from this condition we put on what we call a two-way connection. This is very light and by tinning the ends of the wire the solder is allowed to run down the wire as far as possible so as to support the strands of wire, before putting the connection on. After this connection is taped we pull it over to the eye in the bottom half of the motor casing and either tape it or tie it there so it is not continually under the oil drip of the axle bearings.

Another thing that has helped is to keep the motor leads off of the axle on the split type motors. To do this we welded a support for the lead blocks from one side of the motor to the other, not allowing them to rub in two on the axle.

Our carhouse location is 2.75 miles from the center of the city, 15.80 miles to the end of one interurban line, 20.70 miles to the end of another interurban line and 11.06 miles to the end of our farthest city and suburban line. We have just this month received a Ford car with small open body and are fitting it up with one jack and a lot of small tools and materials so that in

*Abstract of paper presented at meeting of the Electric Railway Association of Equipment Men, Southern Properties, Chattanooga, Tenn., July 28-30, 1926.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Aug. 11—Metropolitan Section A.E.R.A., annual outing, Pelham Bay Park, New York.

Aug. 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

case of trouble we can get to it quickly. We think we are going to find this useful.

Our Experiences with Safety Cars*

BY W. N. LARISSEY

Foreman Edgewood Barn, Georgia Railway & Power Company, Atlanta, Ga.

ATTLANTA has 40 safety cars, 46 ft. 6 in. over bumpers, seating 48. They have front door entrance and exit and rear door exit. The rear door is operated by treadle interlocked with line breaker and air brake. Rear door closes within 4 in. before brakes are released. The front door is controlled by the operator and is not interlocked with line breaker or brakes.

On Dec. 13, 1925, one line of ten cars went into service and we experienced a lot of trouble with particles of pipe scale and trash blocking the valve seats, causing valves to function improperly. We next experienced trouble with leather valve seats giving way, and also with shuttle valves cutting through gaskets. We are now putting in valve seats and gaskets of material called "WABCO," which looks as though it would have a longer life and cause less trouble.

When the cars first went into service we experienced considerable trouble with dry stems in the M-28 brake valve; later the oil well was extended down to the bottom of the valve stem. We now use "Dot" fittings on them and have no trouble.

Between Dec. 13 and Jan. 13 last a total of 39 schedules were placed in service, with the 40 cars on the same headway as formerly with two-man cars, except that on two of these routes the running time was reduced five minutes for the round trip, or from 1:05 to one hour.

These new cars have been operating approximately seven months and in

that time have averaged 1,143 miles per accident of all kinds, including complaints and miscellaneous things that are reported. The system average is about 2,500 miles per accident. The month of June with the 40 safety cars there was a total of 109 accidents, which shows an average of 1,270 miles per accident.

Included in all accidents there have been about twelve at the rear door, two or three of these being where crippled folks with crutches placed their crutches on the ground and got caught in the door before they could get beyond reach. The balance of the twelve were negroes who tried to get in the rear door while other passengers were coming out. About six accidents have occurred at the front door with children placing their fingers in the frame of the sliding door.

There have been three or four cases of passengers trying to board the car as the front door was being closed, but no injuries resulted. There have been no other accidents at the front door in connection with passengers boarding or alighting. The balance of the accidents have been collisions with automobiles.

We have had the least trouble with operators who were already motormen. Training is of the utmost importance, and a few men have been found who possibly may never make good operators.

So far there has not been a single case of an operator being relieved from his run on account of not being able to make the schedules, which are the same as formerly with two-man cars. The schedule speed for the system has been increased from 9 to 9.75 m.p.h. including layover. As high an accelerating rate as is found comfortable is used. At present it is approximately 1½ m.p.h. per second.

Work Which Has Overcome Some of Our Troubles*

BY F. G. KOENIG

Foreman Butler Carbarn, Georgia Railway & Power Company, Atlanta, Ga.

IN THE overhauling of controllers we found that sand-blasting is an important factor, as it will remove all the old carbon dust and dirt that could hardly be scraped or blown out.

On K-28 controllers that had been in service for a long time the bearing at the base of the stand was reamed out, a ½-in. brass bushing inserted and the end of the controller cylinder was turned to fit the bushing. All composition connection blocks and finger bases were removed and replaced with ones made of hardwood. These were treated with a good grade of insulating varnish. This work improved our condition and has been a factor in reducing K-28 controller troubles or failures.

On all of our older type cars rotten insulation and cable covering were removed from under the platform, where they were unprotected from weather conditions. Compressor wires running from a switch on the dash were pulled up through the bulkhead and heater wires that crossed from one side to the other were taken care of likewise, doing away with all small

wires under the platform. All cables were then painted with a heavy coat of "P&B" paint. Metal splash guards were installed so as to protect the cables and equipment from wheel wash. This has done much toward getting weak points out of our system.

The equipping of all of our cars with American type E slack adjusters and the standardization of the foundation brake rigging have insured safer and smoother operation of the cars. A periodical cleaning and inspection of the air brake equipment has eliminated the bad brake situation.

We have a total of 364 double-truck cars which were equipped last fall with Economy meters. By starting a power-saving program among the trainmen they have paid more attention to the

operation of their cars, with the result that there has not only been a decrease in the consumption of power of 11 per cent but these meters have helped in locating mechanical and electrical defects that regular inspection had not determined.

A general shop and barn improvement, new machinery and labor-saving devices, etc., have given us an opportunity to do better work. Definite and thorough overhauling of cars, such as they are doing in New Orleans, and we are trying to do in Atlanta, has been a big help. We are learning that definite and careful inspection not only avoids trouble but also keeps down repairs; in other words, good overhauling and good inspection will eventually result in more reliable service.

Advantages of the LB 2-A Controller Handle on Modern Equipments*

BY GUS C. KRAUS

Assistant to the Superintendent of Rolling Stock and Shops
New Orleans Public Service, Inc.

TO GIVE passengers the maximum of comfort and convenience at the minimum maintenance cost is the modern trend in street railway service. To this end our rolling stock and shops department employs line breakers in connection with its type K platform controllers. Line breakers are primarily an asset in that they protect the meters and other electrical equipment from abuse and high maintenance costs. In addition, the use of line breakers eliminates heavy arcing and consequent blowing of overhead switches, previously a source of annoyance to passengers.

In the operation of line breakers it is necessary to have a special form of auxiliary control. This auxiliary control takes one of two forms, either a complicated ratchet switch mechanism affixed to the main cylinder of the controller, as in our K-36-JR and K-68-A types, or the recently developed LB 2-A controller handle of General Electric Company manufacture. The LB 2-A handles have been tried on three of our cars, two for a year and one for four months, and have been found to possess so many advantages over the ratchet switch mechanism that our department has undertaken to install 177 equipments with the new handles in the immediate future.

The new handles have many advantages over the ratchet mechanism from a standpoint of operation. This handle on notching up operates just the same as all other platform controllers used with line breaker equipment, but should it be moved $\frac{1}{2}$ in. to $\frac{1}{2}$ in. back, or toward the "off" position, the auxiliary circuit of the line breaker is opened, thus opening the main contacts in the line breaker before controller contacts have left the main fingers in the controller. This eliminates all burning in the controller when throwing the handle to the "off" position. These fea-

tures help to speed up service in that they eliminate failure of pawls to engage in ratchet when pawls become worn, thus avoiding holding circuits open. On operating cars in congested districts it is possible to "creep" by notching up to the first point, then moving back $\frac{1}{2}$ in. without having to return completely to the "off" position in order to break the circuit. Then, too, platform men find the cars equipped with LB 2-A handles easier to operate because of the low handle with improved knob-grip. The handle is $1\frac{1}{2}$ in. lower than the old style. The number of controller complaints on our experimental cars has been considerably reduced over our period of operation with LB 2-A handles. For example, over a one-year period there were eleven controller complaint cards against car No. 801 with ratchet switch mechanism, while during the same time there were only three controller complaint cards against car No. 800 with LB 2-A handles, otherwise similar in equipment and operating conditions.

These handles possess many advantages over the ratchet switch mechanism from a standpoint of maintenance. Their use eliminates all special mechanism at the bottom of the main controller cylinder, which position, when controllers are mounted on the platform, is an awkward one in which to work when making repairs. Because of the position of the LB 2-A handle on top of dial plate, it is easily accessible for renewal and repairs. The use of the handles has eliminated all trouble due to stubbing fingers and burned fingers and segments. Our rolling stock and shops department has changed very few fingers and segments since the installation of LB 2-A handles on our experimental cars.

It has been found that the time for making repairs has been cut in half over that required with ratchet switch mechanism. A comparative study of inspection costs, total maintenance and time of installation of both the LB 2-A handles and the ratchet switch mech-

anism has been made by our department, and the following figures are submitted:

Six hours are required to install ratchet switch mechanism on controller, and an additional two hours are required to mount controller on platform; total time of installation on platform is eight hours. Three hours are required to install LB 2-A handles on controller, and an additional hour is required to mount controller on platform; total time of installation on platform is four hours.

Car No. 801, equipped with ratchet switch mechanism, ran 37,784 miles, incurring an expense of \$5.64 for controller maintenance. This corresponds to a cost of 0.01493 cent per car-mile. Car No. 800, similar in equipment to and operating under the same conditions as No. 801, but having LB 2-A handles, ran 40,469 miles, incurring an expense of \$1.03. This corresponds to a cost of 0.00254 cent per car-mile.

Car No. 623, with ratchet switch mechanism, ran 37,004 miles, incurring an expense of \$4.26 for controller maintenance, or a cost of 0.0115 cent per car-mile. Car No. 622, similar in equipment to and operating under the same conditions as No. 623, but having LB 2-A handles, ran 28,819 miles, incurring an expense of \$1.33, or a cost of 0.00464 cent per car-mile.

Car No. 950, with ratchet switch attachment, ran 37,870 miles, incurring an expense of \$4.27 for controller maintenance, or a cost of 0.01126 cent per car-mile. Car No. 951, similar in equipment to and operating under the same conditions as No. 950, ran 9,941 miles since the installation of LB 2-A handles, incurring no expense for controller maintenance.

Wisconsin Program Arranged

COMPLETION of the program for the annual convention of the electric railway section of the Wisconsin Utilities Association in La Crosse on Aug. 12 and 13 has been announced by Nels C. Rasmussen of the Wisconsin Valley Electric Company, Wausau, chairman of the section. Improvement of local transportation conditions in all cities of the state, with the view of preventing accidents and of minimizing delays caused by continuously increasing congestion on streets, will be discussed at the convention. About 150 company representatives from all parts of the state are expected to attend.

Thursday, Aug. 12, 9 to 10:30 A.M.

Registration—Hotel Stoddard.

11 A.M.

Session held at Chamber of Commerce Hall, corner of Fifth and State Streets, one block east of Hotel Stoddard.

Address of Welcome—Hon. J. J. Verchota, Mayor of La Crosse.

Chairman's Address—Nels C. Rasmussen, Wisconsin Valley Electric Company, Wausau.

Announcements.
Address—"The Opportunities of a Transportation Man for Good Public Relations," C. R. Phenicle, Wisconsin Public Service Corporation, Green Bay.

Discussion.

12:30 P.M.

"Get-Acquainted Luncheon" at the Hotel Stoddard.

Thursday, Aug. 12, 2 P.M.

Session held at Chamber of Commerce Hall.

Paper—"Why I am Interested in Trans-

*Abstract of paper presented at meeting of the Electric Railway Association of Equipment Men, Southern Properties, Chattanooga, Tenn., July 28-30, 1926.

portation as a Vocation," Oliver Wynn, East Side High School, Madison.

Paper—"Improvements in Handling Traffic by Means of Circulating Load Through Rear Exit," P. W. Gerhardt, T. M. E. R. & L. Co., Milwaukee.

Paper—"Methods of Handling Traffic with Pneumatic Door Operation Under Different Weather Conditions," Oscar A. Broten, National Pneumatic Company, Chicago.

Discussion of above papers.

Report—"A Study of Noise in Transportation Equipment," Kent Wooldridge (railway fellowship student, now with Chicago Rapid Transit Company, Chicago).

Discussion.

4 P.M.

Inspection trip over lines and through the car barns and automatic substation of the Mississippi Valley Public Service Company.

6:30 P.M.

Informal dinner followed by dancing—Pioneer Club (Fifth and Market Streets). To reach the Pioneer Club from the Hotel Stoddard, go one block east to Fifth Street and proceed south on Fifth several blocks to Market Street. Music by Marking Brothers Orchestra. A few songs but no speeches.

Friday, Aug. 13, 9:30 A.M.

Report—"Accident Experience in Wisconsin," R. M. Howard, Mississippi Valley Public Service Company, Winona.

Paper—"Accident Prevention from an Executive Viewpoint," B. W. Arnold, Chicago, North Shore & Milwaukee Railroad Company, Milwaukee.

Discussion.

Address—"The Present Local Transportation Situation in Wisconsin," Commissioner Andrew R. McDonald, Railroad Commission of Wisconsin, Madison.

Address—President F. R. Coates of the American Electric Railway Association, New York City.

Report of the nominating committee and election of officers for the electric railway section for the coming year.

Address—"Co-ordination of Car and Bus Operation," H. G. Monger, T. M. E. R. & L. Co., Milwaukee.

Discussion.

12:15 P.M.

Luncheon for men and women—Hotel Stoddard.

2 P.M.

Golf at the La Crosse Country Club, automobile trip to Coon Valley (the Alps of Wisconsin), or fishing trip to Galesville (where you really catch them). When registering please sign up for the trip you prefer.

American Association News

American Executive Committee Meeting

Committee Reports Predict Successful Convention at Cleveland—Exhibit Space Sales Exceed Last Year—Enlarged Facilities Provided—Affiliated Associations Plan Timely Programs

MEMBERS of the American Electric Railway Association executive committee were guests of Barron Collier, treasurer of the association, on the steam yacht *Florida* during a meeting of the committee held on July 30, 1926. Reports of various standing committees and plans for the coming convention at Cleveland were given consideration.

J. P. Barnes, as chairman of the committee on subjects and meetings, outlined the tentative program for the Cleveland convention. Prominent speakers have accepted invitations to present various phases of timely subjects of interest to the industry, which

include the topics of "unified transportation service," "modern equipment," "street congestion," "the acquirement of new capital" and "industrial education." The final program for the convention, together with a list of speakers, will be available for publication shortly after Sept. 1.

On the invitation of President Frank R. Coates, W. H. Sawyer presented a brief outline of transportation conditions in Australia.

Barron Collier reported for the committee on publicity and said that studies made by his committee indicate that approximately \$4,500,000 is being spent annually by electric railways in local advertising. The committee has made a large collection of advertising material used in newspapers, car cards, buses, etc. It is planning to reproduce the best selections in pamphlet form for distribution among members of the association as copy suggestions and examples of how to use material sent out by the association in local advertising. J. P. Barnes testified to the value of the service rendered by the association's director of advertising in the preparation of publicity material in Louisville.

J. H. Hanna, chairman of the membership committee, reported a gain of two operating companies, 23 manufac-

Plan to Reach Cleveland Sunday

DUE to the full program which is planned for the first day's session of the convention at Cleveland on Monday, Oct. 4, all delegates are urged by the executive committee to plan their arrival at Cleveland for Sunday, Oct. 3, to avoid congestion in registration and delay in reaching the meeting on Monday.



American Electric Railway Association Executive Committee, Members of the Association Staff and Guests Who Attended Meeting on Board Steam Yacht *Florida* with Barron Collier Acting as Host

Front Row, Reading from Left to Right: Charles R. Ellicott, James W. Welsh, E. J. Murphy, E. F. Wickwire, Fred C. J. Dell, Charles L. Henry, Charles Gordon, W. H. Sawyer, Barron Collier, J. N. Shannahan, B. A. Hegeman, Jr., Charles R. Harte, A. T. Davison.

Rear Row: L. F. Schrafel, John W. Colton, Robert Dougan, J. K. Newman, Edward Dana, S. J. Cotsworth, J. H. Hanna, G. H. Clifford, L. S. Storrs, Frank R. Coates, J. P. Barnes, L. H. Palmer, E. T. Faber, M. B. Lambert, G. C. Hecker and Paul E. Wilson. Captain Peter Songdahl is on the bridge.

turing companies and eighteen individual members since the last executive committee meeting.

For the committee on finance, B. A. Hegeman, Jr., reported in place of Chairman R. P. Stevens, who was absent.

L. S. Storrs outlined some of the work being done by the managing director's office. Hearings by the Interstate Commerce Commission on the bus-railway situation and the status of developments in connection with the application of Interstate Commerce Commission inspection rules to electric locomotives operated by interurban railways was also reported by Mr. Storrs.

A memorial to Charles A. Coffin, commenting on the significance of his life and work in the development of the electrical art and the transportation industry, was read by Mr. Storrs and unanimously adopted by the association.

Paul Wilson, secretary Cleveland Railway, reporting for Col. Joseph H. Alexander, as chairman of the Cleveland convention committee, announced that the contract for the Auditorium west wing has been let to the H. K. Ferguson Company and that work has been started on the building, which will be ready in ample time to accommodate exhibitors.

Director of Exhibits Fred Dell reported that up to the close of business July 29, 112,916 sq.ft. of space had been assigned to 202 member companies, and comparing this figure with the figures on the same date the previous year it was found that there were thirteen more exhibitors using 25,648 more square feet of space, 87,268 sq.ft. having been allotted on July 29, 1925.

So far as track space is concerned, Mr. Dell reported that seven companies had applied for 720 lineal feet in Section D, on which street cars will be shown, and that additional applications were on the way for street car space. The committee was also advised that four companies would show operating maintenance of way exhibits in outdoor covered track space, known as Section E and totaling 120 lineal feet. In connection with the exhibit of improved cars, which the committee is anxious to stimulate, C. R. Ellicott suggested the advisability of having the association sponsor an exhibit of obsolete as well as modern cars for the purpose of bringing out the progress which has been made in car developments.

Chairman Cotsworth of the entertainment committee announced that his committee has definitely decided on just what activities will be arranged for the entertainment of delegates and their ladies, and while the committee has its plans under way, it has been decided not to make them public at the present time, the committee's opinion being that the element of surprise would greatly enhance the effect of the various entertainment features.

Transportation arrangements for the convention, handled by a committee under the chairmanship of Edwin C. Faber, will follow the plan used last year, that of dividing the country into six zones with a sub-chairman in charge of the arrangements in each zone. Special trains will be run from important cities through the country. Discussion brought out the importance of having delegates make arrangements to arrive

*Resolutions Commemorating
Work of Charles A. Coffin in
Transportation Field, Passed
at Executive Committee Meet-
ing of the American Electric
Railway Association July 30*

Thirty-eight years ago Charles Albert Coffin had the vision to see the future of street railway electrification and the far-reaching economic and social effects which it would have on our urban population. With him seeing was acting. He promptly inaugurated a department for the development of that business in his own company, and encouraged his engineers to make researches and experiments in the street railway field. At that time there were a number of important patents affecting, and many skilled and able men interested in, the project, but there was a great need of finance and organization to enable the men and the inventions to function in the public interest. It was this binding influence which Mr. Coffin supplied with his own energy and personality.

The General Electric Company in 1922 made available "A gold medal, to be known as the 'Charles A. Coffin Medal,' to be awarded annually to the electric railway company within the United States which, during the year, has made the most distinguished contribution to the development of electric transportation for the convenience and well-being of the public and the benefit of the industry." This award is symbolic of the fruitful service which Mr. Coffin has rendered our industry and our nation.

The American Electric Railway Association takes proud cognizance of these facts, and its executive committee has adopted this memorial and directed that it be spread upon its record and be sent to Mrs. Coffin, with the sympathy of the association.

ing committees are being completed and plans are being made by the engineering group to build interest and stimulate discussion of current problems during the convention.

President G. H. Clifford of the Transportation and Traffic Association, said that the convention program of that association has been practically completed and will follow very closely the transportation phases of the general topics contemplated in the A.E.R.A. program.

Regarding the work of the committee on co-operation with manufacturers, Chairman E. F. Wickwire discussed a plan for preparing a series of electric railway slogans.

On the subject of education, Chairman Edward Dana said that various prominent railways have agreed to send representatives to participate in the special foreman's conference planned for the convention program. An effort is also being made by the committee to prepare an exhibit of educational work at the convention.

The insurance committee, through its chairman, Paul Wilson, reported that there is from \$13,000,000 to \$15,000,000 more insurance carried by the electric railways in 1925 than in 1924 at a reduction in the total premium. Despite this fact, however, the committee is of the opinion that the rates are still higher than are justified by the loss records of the industry. Relative to bus depreciation, Chairman L. H. Palmer could report only progress in the studies of this subject, because there has not yet been enough experience to determine what a fair rate should be. Director of Publicity Labert St. Clair reported for the committee on public speaking in the absence of B. I. Budd and said that the work of this committee is being handled largely by the local organizations set up in various districts.

Both Mr. Storrs and Mr. Hecker discussed the work of the committee on essential features of modern cars. Mr. Hecker indicated the cost of publishing this information according to the recommendations made by the executive committee of manufacturers, which received the report. It was recommended that a certain number of paper-covered copies be prepared as pamphlets, together with a number of bound copies for distribution and sale to member companies. The executive committee approved the recommendation to print 3,500 copies, of which 1,500 are to be bound in book form.

On the subject of special taxes, A. T. Davison, chairman, outlined the progress of his committee's work. He discussed plans of the committee for making a study of the tax situation in various states by appointing representatives to co-operate in this work for each state. It is the intention of the committee to handle this subject as a general utility problem, and it was suggested that the final recommendations resulting from the committee's studies be submitted to various state associations, where they existed, for preliminary approval before final adoption. These tentative plans were approved by the executive committee.

J. K. Newman addressed the committee on the general subject of publicity and outlined the need for a co-ordinated national campaign.

in Cleveland on Sunday in order to avoid congestion of registration Monday.

The 45th annual convention of the A.E.R.A. promises to be the largest and most successful ever held by this organization, and from the advance requests for hotel reservations, as reported by Paul Wilson, chairman of the hotel and housing committee, it seems a foregone conclusion that the attendance and registration will be the heaviest for which the association has ever had to prepare.

A sample of an association flag prepared by a committee of which T. W. Casey is chairman was inspected and accepted by the executive committee. Mr. Storrs reported on the re-establishment of the Anthony Brady medal, which was discontinued during the war. This is to be awarded to the company making the best contribution toward increasing safety of railway operation.

For the Engineering Association, President C. R. Harte reported the resignation of M. B. Rosevear from the Engineering Association executive committee. Reports of various engineer-

Mr. Shannahan, as chairman of the nominating committee, read that committee's recommendations for officers and members of the executive committee to fill expiring terms: President, W. H. Sawyer, president East St. Louis & Suburban Railway; first vice-president, R. P. Stevens, president Republic Railway & Light Company; second vice-president, James P. Barnes, president Louisville Railway; third vice-president, Paul Shoup, president Pacific Electric Railway; fourth vice-president, J. H. Hanna, president Capital Traction Company; treasurer, Barron Collier, president Barron G. Collier, Inc.

For operating and manufacturer members of the executive committee at large for the three-year terms expiring in 1929 the following nominations were made: Operating members—Luke C. Bradley, president Virginia Electric & Power Company; C. E. Groesbeck, vice-president Electric Bond & Share Company. Manufacturer members—Harry L. Brown, secretary the Ohio Brass Company; T. W. Casey, vice-president National Pneumatic Company; Edwin B. Meissner, president and general manager St. Louis Car Company.

The adoption of these names was unanimously approved by the executive committee.

Attendance at the meeting included the following: President Frank R. Coates, W. H. Sawyer, James P. Barnes, Lucius S. Storrs, Barron Collier, J. N. Shannahan, J. H. Hanna, E. F. Wickwire, B. A. Hegeman, Jr., M. B. Lambert, S. J. Cotsworth, Charles R. Elliott, Charles L. Henry, C. R. Harte, G. H. Clifford, J. W. Welsh, Paul E. Wilson, L. H. Palmer, E. T. Faber, A. T. Davison, Edward Dana and J. K. Newman.

Transportation & Traffic Executive

REPORTS of the various committees of the Transportation & Traffic Association were submitted to the executive committee for approval at a meeting held at association headquarters, New York, July 29. With minor amendments the reports of the committees on accident prevention, traffic congestion and merchandising transportation were approved. For the committee on bus operation, J. B. Stewart, Jr., chairman, reported that the work had not yet been completed. For that reason copies of the report when ready will be sent to the members of the executive committee for their consideration, and they, in turn, will transmit their suggestions for approval to J. V. Sullivan, sponsor.

Plans for the convention program were tentatively agreed upon. The report of the committee on merchandising transportation will be presented on Monday, Oct. 4. It is planned that this report, with its discussions, will consume the first two hours of the session. This will be followed by several speakers on publicity and advertising as applied to merchandising transportation.

A joint session with the Claims Association will be held on Tuesday, Oct. 5. The report of the committee on traffic congestion will first be presented and

discussed. It is expected that this will occupy approximately one hour of the program. Following this the report of the joint committee on accident prevention will be presented and discussed. The executive committee is anxious that there be brought out fully in the discussions the necessity of the closest kind of co-operation between the claim department and the operating department, in order that accidents may be reduced to a minimum.

No regular sessions of any of the associations will be held on Wednesday, Oct. 6, as in past years this day has been set aside exclusively for the inspection of manufacturers' exhibits.

Thursday, Oct. 7, will be devoted entirely to a presentation and discussion of the report of the committee on bus operation. It was stated that the supply of pamphlets entitled "Bus Rules" drafted by the committee on trackless vehicle operation in 1924 had been exhausted and that it was planned to have a new supply printed. These rules are to be forwarded to the chairman of the present committee on bus operation with the request that he review them and suggest necessary modifications, after which they will be reprinted.

The next meeting of the executive committee will be held at the Hotel Hollenden, Cleveland, Sunday evening, Oct. 3, at 8 o'clock. Election of new officers of the association will be held on Monday afternoon, Oct. 4.

Those present at the meeting were: G. H. Clifford, chairman; Samuel Riddle, J. V. Sullivan, E. M. Walker, Paul E. Wilson, George B. Anderson, W. H. Boyce and J. W. Welsh.

Many Additions to Association Membership

NUMEROUS applications for company and associate membership in the American Electric Railway Association received since May 14 were approved at a meeting of the executive committee, July 30. These include two railway companies, 28 manufacturing companies and 24 individuals. Following are a list of company applications:

Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio.
Cincinnati Street Railway, Cincinnati, Ohio.
Ahlberg Bearing Company, Chicago, Ill.
American Brown Boveri Electric Corporation, New York, N. Y.
Baker-Raulang Company, Cleveland, Ohio.
Cleveland Tanning Company, Cleveland, Ohio.
D'Arcy Spring Company, Kalamazoo, Mich.
Joseph Dixon Crucible Company, Jersey City, N. J.
Erie Malleable Iron Company, Erie, Pa.
Falls Rubber Company of Akron, Inc., Akron, Ohio.
Kelton-Aurand Manufacturing Company, Bay City, Mich.
Macdonald Manufacturing Company, Cleveland, Ohio.
Manley Manufacturing Company, York, Pa.
Metropolitan Coach & Cab Corporation, Cleveland, Ohio.
Mohawk Rubber Company of New York, Inc., Akron, Ohio.
Motor Improvements, Inc., Newark, N. J.
Motor Products Corporation, Detroit, Mich.
North American Railway Construction Company, Chicago, Ill.
John C. Paige & Company (Insurance), Boston, Mass.
Rollway Bearing Company, Inc., Syracuse, N. Y.
Phoenix Ice Machine Company, Cleveland, Ohio.

Pneumatic Scale Corporation, Ltd., Norfolk Downs, Mass.
Scovill Manufacturing Company, Waterbury, Conn.
Sisson Supply Company, New York, N. Y.
Stengel & Rothschild, Inc., Newark, N. J.
Vellumold Company, Boston, Mass.
W-A Manufacturing & Sales Company, Newark, N. J.
Wellman Bronze Company, Cleveland, Ohio.
Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio.
Wright Rubber Products Company, Racine, Wis.

Latest Bulletins Available

SPECIAL reports have been prepared and are available to member companies upon request, as follows:

Bulletin No. 93. Analysis of Wage Agreements on Interurban Lines.—An analytical digest of the provisions appearing in the labor contracts of a group of representative interurban companies, arranged in such a way as to make possible a ready comparison of working conditions.

Bulletin No. 94. Motor Bus Operations in California.—Contains a comparison of the results of motor bus operations of class A companies in California in 1924 and 1925, including comparative income statement, balance sheet and operating statistics. Also contains the individual income statements, balance sheets and operating statistics reported to the California Railroad Commission by all class A companies for the calendar year 1925. Freight as well as passenger operations are included. Extracted from the annual report of the California Railroad Commission for the year ended June 30, 1925.

Bulletin No. 95. Recent Developments of One-Man Car Operation.—Containing complete list of electric railways now operating one-man cars, showing the number of cars operated by each company. Also gives a comparison of the results of operations with one-man and two-man cars, including the comparative accident record of each; and a record and summary of all recent cases in which the legality or propriety of operating one-man cars has been attacked.

Bulletin No. 96. Rate of Return Allowed Electric Railways.—Extracts from decisions of public utility commissions in which the rate has been fixed after an official determination of the amount upon which the company is entitled to earn a return. This is a new edition of Bulletin 18 of April 1, 1925, and includes decisions handed down since that date.

Bulletin No. 97. Traffic Ratios, Part 3. Combination City and Interurban Lines.—A tabulation of figures derived from the operating reports of these companies for 1925. Included in the data given are average speed, revenue passenger per car-mile, per mile of track, and per car operated, the operating ratio, revenue per mile of track, operating income, etc.

In addition to the above, the following supplements have been prepared, bringing the information they cover down to Aug. 1, 1926:

Supplement No. 5 to Trainmen's Wage Bulletin No. 69.
Supplement No. 5 to Busmen's Wage Bulletin No. 70.
Supplement No. 11 to City and Interurban Fare Bulletin Nos. 40 and 41.
Cost of Living Studies (Bulletin No. 98).

A cumulative list of the reports and bulletins of the Bureau of Information and Service is now available to member companies. This includes all bulletins issued in the past, of which there is now on hand sufficient supply to meet the request of members that may be interested.

New England Outing Held

MEMBERS of the New England Street Railway Club and office employees of the Cumberland County Power & Light Company recently held a joint outing at Long Island, near Portland, Me. This was the annual picnic of each organization and was well attended. A baseball game and various other sporting events were on the program, which included also a sail on Casco Bay and a clambake.

The News of the Industry

New Plan for Subway in Chicago

A new subway plan for Chicago, calling for a tube under State Street from Chicago Avenue south to Twelfth Street and another under Jackson and Washington Boulevards from Michigan Avenue west to Clinton Street, is soon to be submitted to the local transportation committee of the City Council by the Citizens' Subway Commission. The commission is composed of representatives of loop property owners, hotels, banks and theaters.

The plan, some of the outstanding features of which were made known recently, differs from numerous other subway schemes that have been proposed for Chicago, particularly in its recommendations for a reduction in the number of streets in which bores should be made.

Instead of an initial subway under State Street from North Avenue to 22d Street, the recommendations of the commission will probably be for the construction of a much shorter line at a saving of millions of dollars.

It is reported that the existing Washington and Van Buren Street tunnels, now used by surface cars in passing under the Chicago River, will be used in connection with a loop in Washington and Jackson Boulevards for east and west subways. This loop would be exclusively for street cars, while the north and south subway on State Street would be for the elevated lines alone.

The cost of building this initial system, which is based on operating unification of the traction lines as provided for in the ordinance now pending, will be defrayed by special assessment. The general public benefit will be paid out of the city's \$45,000,000 traction fund.

Invaluable work has been done by the commission in organizing downtown property owners into a group that has indicated almost unanimous willingness to stand assessment for subway construction.

The commission has announced that it is also prepared to recommend a number of extensions of the elevated lines, action on which has long been delayed.

Confusion Continues in Columbia

The transportation tangle in Columbia, S. C., with jitneys, street cars and 29-passenger buses all playing a hand, is still giving the City Council some uneasy moments.

The Columbia Chamber of Commerce recently took some small part in the affair, but has definitely withdrawn, leaving the matter in the hands of the City Council. The Carolina Transit Company, which operates the bus lines, addressed the Chamber of Commerce to the effect that unless the 10-cent jitneys were curtailed in their operations, it, the bus company, would be compelled

to discontinue operations. When the bus company began operating lines covering practically all of the city, street car service, with the exception of three lines, was discontinued, so that no competition might be offered the bus company by the trolleys, and the railway was apparently glad to get out, it claiming that it was losing steadily, month by month. The bus company manager, Chester Hawkins, was of the opinion that if the buses were allowed to operate untrammelled they would be able to drive out the jitneys, but this belief has proved erroneous and the jitneys, to the number of about 130, operate daily with no set schedules and without having any fixed routes.

City Council has an ordinance to the effect that operators of jitneys and transfer cars must carry bond in the sum of \$250. This ordinance has only recently become effective. It was thought that its enforcement would push the jitneys to the wall, but the operators of jitneys and other conveyances plan to organize a bonding company of their own.

There was some talk of having the railway restore its service on the lines discontinued when the buses began operating, but the State Railroad Commission, which has charge of this matter, apparently has no intention of requesting the railway to operate its lines at a loss.

Jail Sentences for Indianapolis Men

Strike Leaders Who Pretended Not to Take Seriously a Court Order Are Committed by U. S. District Judge Baltzell—A Review of the Proceedings and the Statements that Caused the Court to Act

NINETY days in jail was the sentence imposed upon John M. Parker and Robert B. Armstrong, vice-presidents of the Amalgamated Association and organizers of the employees of the Indianapolis Street Railway, Indianapolis, Ind. Sentence was passed on July 31 by Judge Robert C. Baltzell in the United States District Court. Both men, together with nine others, were charged with violating the terms of an injunction issued on July 3 relating to the strike.

Steps will be taken to appeal the decision, but the two organizers have been in jail since July 28, when they were found guilty in court, after a hearing which lasted most of the day.

In passing sentence on Parker and Armstrong the judge remarked that their case was the most flagrant of its kind that had come to his attention. Looking at Parker, the court said:

You bragged in a speech to the union the morning the strike vote was taken that if you were cited for contempt you would appeal the case. You are going to have that opportunity.

Albert Ward, United States district attorney, said the government would oppose bail for Parker and Armstrong pending appeal. Attorneys for the men asked for 60 days to file a bill of exceptions, but this was opposed by Mr. Ward, who said that evidence would be submitted to court on the right of the defendants to a writ of *supersedeas*.

Eight other men, all former employees of the Indianapolis Street Railway, were before the court for disposition of their cases. One man, who had been found guilty, was not present.

Efforts were made the afternoon of July 30 by R. D. Bland, Detroit, secretary-treasurer of the Amalgamated Association, and attorneys for the or-

ganizers to end the strike, but the strikers protested.

In the meantime operatives of the Department of Justice are preparing for the return of Harry Boggs from West Virginia. Mr. Boggs is temporary president of the Indianapolis union and is wanted for violation of the court injunction.

At the last meeting of strikers it was voted to request the entire labor movement of Indianapolis to stage a demonstration against the action taken by city and state officials in connection with the strike. A resolution also was passed at the meeting urging "that a request be made at the next American Federation of Labor convention, to be held in October at Detroit, that all money, stocks and bonds be withdrawn from the banks of Indianapolis and deposited in Washington, D. C."

At the offices of the railway it was said that on July 31, 30 former employees applied for their old positions. James P. Tretton, superintendent, said that in cases in which it was found that the record of the former employee was good and officials were convinced he had not taken part in any acts of violence during the strike, the man would be re-employed, but seniority rights would be forfeited.

Edgar Day, former employee, convicted of contempt by a jury, was sentenced to 30 days in jail and fined the amount of the costs in the case. The cases of seven other former employees who pleaded guilty to the contempt charges were disposed of as follows:

Everett Ellis, twenty days in jail; Russell Bane, who provided the government with most of its information, taken under advisement and released on his own recognizance; John Frakes, twenty days in jail; Oscar Southern,

ten days; Joe Wittington, ten days; Mervin McNew, taken under advisement and released.

Everett Talley's case was taken under advisement. Most of the minor offenders had been in jail ten and eleven days before sentence was passed, but all sentences are from the day of issuance.

Jefferson Fade, who was convicted by the court, was sent back to jail without sentence. At the time of his conviction the court told Fade if he could get a reliable citizen to vouch for his good behavior the court might release him.

When Judge Baltzell called Parker and Armstrong before him he asked whether they had anything to say and whether they felt they had violated the injunction. Both said they had not intended to violate the injunction.

"What do you think would be the natural effect of your speeches in a meeting of 800 men?" the court asked.

"Your Honor, we had no intention to violate the injunction in those speeches," said Parker. "I have been served with several injunctions and never before have been convicted of violating any of them. It's the way you read those speeches that counts, your Honor."

"The speeches," interrupted Judge Baltzell, "contain boasts that you have been able to defy courts and I never have seen a more contemptuous case. The more I read those speeches, and I have read them several times, the more convinced I am of their contemptuous character."

"Those speeches," said Parker, "were made within an hour after the injunction had been served upon us by the United States marshal. We did not have legal advice as to what would constitute a violation of this injunction. All we two knew was just what we could read in the injunction. Had we had time to dissect the injunction we would not have made any utterances that might be construed to be in contempt of court."

"But," came back the judge, "you say you have read more injunctions than Will Latta or even myself, that you know about injunctions. You said this in your speech."

In commenting on the jail sentence, the court said that "to fix a fine in this case merely would mean the fixing of a license fee for contempt of court. That would permit you to go free and know the price to be paid for future violations in case you saw fit to be in contempt again."

Day, Ellis, Bane and Frakes were alleged to have met at Day's house and planned acts of violence. Following the meeting, stones were hurled at street cars, wires were thrown over trolley wires and explosives placed on the tracks. Southern, Wittington, McNew and Talley were alleged to have hurled stones at cars and to have committed other acts of violence. Fade was found guilty of having called another employee a scab and to have influenced Jacobs to quit working for the company in violation of his labor contract.

Speeches made by John M. Parker and Robert B. Armstrong, organizers for the Amalgamated Association, at the meeting at which a strike was called got them into jail. In order that the organizers might not be misquoted, they had a court reporter at the meeting to

take down exactly what was said. This reporter, put on the witness stand in federal court by the defendants' own counsel, read what had been said.

The court then said to the defendant attorneys:

I don't see how a lawyer can listen to these speeches and honestly tell me, as an officer of this court, that there has been no violation of that injunction.

Parker was quoted:

I don't know anything about the interpretation of this injunction any more than to read it, but I say that I have read more injunctions than Bill Latta or Watson and, I say it without fear of contradiction, Mr. Judge Baltzell himself. I know something about injunctions. I have a bushel basket full of them home, if anybody wants to look them over, and it doesn't worry me very much.

I never violated an injunction, never was cited for contempt of an injunction, and I want to say to you men that it has been broadcast over this city that I was indicted for dynamiting. I have a telegram in my grip in the hotel received about three weeks ago stating that those charges have been wiped off the books. So that I am not indicted at the present time for anything.

So now, brothers, I am going to quit and give Brother Armstrong an opportunity to say something to you. I have tried to make my position clear. I do not want anybody to misquote me in this hall. I say I am going to live up to every letter in that contract as interpreted to me by our attorneys, who are paid for that advice. If some one wants to make an affidavit that we have counseled you men tonight, then they can cite us for contempt of court. If they cite us for contempt, we will take our medicine, but I don't think they are going to do it, and if Judge Baltzell rules against us you can take this message to the judge that we are going to appeal from his decision. We are not going to take his decision on it.

I am not going to take up very much more of your time. I am going to say this to you, that our attorneys have informed us, which the injunction reads, that we are the plaintiffs, Brother Armstrong and myself—or the defendants rather—and that we are enjoined from advising soliciting you or in any manner whatsoever trying to intimidate you to do anything.

I say again we are going to live up to that order. We are not going to, or wouldn't if there wasn't any injunction, advise you men either to strike or not to strike. There has never been mention made in this hall or any other hall by Brother Armstrong or myself up to the present time about a strike.

They have said on different occasions on June 2 that we were going to strike. We had no intention of striking, because at that time we had only about 750 men. We have been perfecting this organization for the last month, and if I am any judge of human nature, by G-d, it is pretty near perfected.

Another paragraph read:

So we have tried and exhausted all our efforts to bring about some peaceable settlement for you men. We have been to the Governor of the State through the mediator and conciliator of labor, Mr. Dynes, we have been to his Worship Mayor Duvall, on two different occasions. On the last time, last Monday, he dictated a letter to Mr. Todd requesting him to meet us in conference and settle this question and dispute, and anything that could not be settled to submit it to the Public Service Commission for arbitration. So that we have nothing in view at the present for you.

In the meantime attorneys continue their activities toward perfecting an appeal from the contempt judgments. In addition to appealing the cases of Parker and Armstrong, Frank P. Baker, chief counsel for the men, said he would appeal the case of Edgar Day. Mr. Baker said:

The cases involve the question as to the right of the court to issue an injunction which enjoins men from giving advice to the employees. If the Clayton act applies to these cases, there is no question as to the innocence of Parker and Armstrong. The Clayton act provides that no court can issue an injunction to prevent men from advising employees of a company in such a case as this was.

Judge Robert C. Baltzell ruled that the Clayton act did not apply and that under the law Parker and Arm-

strong were not entitled to a jury trial. Mr. Baker said he would ask for bond for the defendants pending their appeal. Albert Ward, United States district attorney, said the government would oppose granting of bond and "the government may have some evidence to present on that bail question."

As to Day's case, Mr. Baker said he did not think that the injunction would be enforceable as to him because, he believed, it could not be made to apply to a man not a party to the suit.

Parker and Armstrong continue in jail. Little is heard of disorders on the cars, but isolated acts of vandalism are being committed.

New Chicago Traffic Film Being Prepared

"The Magic of Transportation," a two-reel motion picture film, produced by the Chicago Surface Lines was received so favorably during the past winter season that a new film is now in the course of preparation.

"The Magic of Transportation" tells the story of the development of electric street car service in Chicago and shows some of the problems faced in street car operation and the importance of street cars to city life. It was shown during the past winter and spring to audiences totaling nearly 100,000.

The new picture will emphasize the difficulties which must be overcome in providing regular and adequate railway service. It will show the effects of interferences of other vehicles with street cars and such obstacles as flooded subways under railway crossings, fires and snowstorms. The picture will be ready for use early in the fall and, like "The Magic of Transportation," will be shown before schools, clubs, civic organizations and similar audiences.

Information compiled by the publicity department indicates that motion pictures are an important factor in creating better public relations.

Plea for Paving Relief in Denver

Despite the material growth of the population of Denver, the Denver Tramway Corporation carried 11,000,000 fewer passengers in 1925 than in 1910. Moreover, gross receipts are declining. These facts are set forth in a petition filed by the company with the City Council of Denver to show cause why the company cannot meet paving assessments.

Total passengers carried were 68,000,000 in 1910 and 57,000,000 in 1925. The petition points out that the company is now paying 13.21 per cent of its gross income for imposts and taxes.

Since 1906 wages have advanced from 22 cents an hour to 59 cents. Materials have advanced 100 per cent in the same period. The fare is 8 cents, two tickets for 15 cents, compared with 5 cents until a few years ago. Gross revenue has declined from \$5,219,094 in 1922 to \$4,814,212 in 1925. On a valuation of \$24,018,047, the corporation is earning 4.22 per cent, or more than 3 per cent less than it is legally allowed.

The company is 30 miles behind in its paving work.

Hearing Starts on Rerouting in Baltimore

The Maryland Public Service Commission on Aug. 3 opened a series of hearings for the purpose of considering changes in the routes of the United Railways lines in Baltimore as recommended by the recent survey of the Baltimore Traffic Survey Commission. The first group of proposed changes considered was known as No. 1 and included nine lines. At the same time this subject was taken up by the commission that body also heard testimony in regard to another recommendation made as a result of the survey. This was to make the City Hall, at Holliday and Fayette Streets, the western terminus of the bus lines operating between the center of the city and the eastern territory, along Fayette Street. The United operates a line of buses along the Fayette Street route and there also are several independent operators.

Most of the discussion before the commission was in regard to the proposed change in the bus terminus. Several of the independent operators declared that 80 per cent of the passengers on the buses are carried to and from points beyond that which the survey commission wants used as the terminus and that to make the change would mean that their business would be ruined.

H. B. Potter, vice-president of the United, explained the advantages and disadvantages of the proposed changes embodied in Group No. 1. Track construction and other necessary work incident to the changes proposed in Group No. 1, he estimated, would cost \$12,000 and it would require at least three months to make. He said, however, that the United does not want to carry out the rerouting plan until all details of the report made by the Survey Commission are ready to be put into effect.

Rebuilding Program at Cincinnati to Be Speeded

To permit the Cincinnati Street Railway, Cincinnati, Ohio, to proceed with an accelerated program of improvements, the City Council has passed an ordinance allowing the railway to borrow \$400,000 so that the betterments may be made within three instead of four years. The money will augment the amounts to be paid into the special depreciation reserve fund as provided for in the franchise ordinance passed last August. The ordinance just passed by the City Council permits the railway to borrow the money in the open market or to take it out of any funds in which the amount is available, except the fare control fund. The franchise ordinance provides that the railway must rehabilitate its system by Dec. 31, 1929, and that each month it must set aside a sum sufficient for that purpose so that an aggregate of \$1,750,000 may be expended for betterments within that period. The action of the City Council enables the company to make these improvements within three years and to advance the financing of the fourth year by borrowing the money. By

following this procedure the railway also will be enabled to keep pace with the street improvement program of the city. It was at the suggestion of C. O. Sherrill, city manager, that the work has been accelerated.

Westchester Road to Continue

Trolley cars will continue to be operated on the lines of the old Westchester Street Railroad, which was officially taken over on July 28 by the Third Avenue Railroad through its subsidiary, the Union Railway. S. W. Huff, president of the Third Avenue Company, declared he felt sure that trolleys would give a less expensive and more satisfactory service than the proposed bus lines. He also explained that it would be practically impossible to install bus service, as that would necessitate obtaining the permission of every municipality on the proposed routes.

Mr. Huff said that he proposed to give Westchester its best trolley service in many years. Twenty cars from the Third Avenue Company's surplus stock will be substituted immediately for the old equipment formerly in use. Also, on the Tarrytown-White Plains line the headway will be cut from twenty to ten minutes. Mr. Huff admitted that a 5-cent fare cannot be maintained and said that application will soon be made to the Public Service Commission for permission to collect a 10-cent fare in each zone.

Service will be resumed at once on the Silver Lake Park line, which was abandoned June 1, and will be continued on the Tarrytown, Scarsdale, Mamaroneck Avenue and White Plains lines.

Tunnels Suggested for Providence

A subway system which would eliminate electric railways from the surface of the streets in the center of Providence, R. I., has been devised by William W. Lewis, Boston subway expert, who was retained by the city to assist Robert Whitten, city planning expert, in devising relief of traffic congestion.

Mr. Lewis's plan consists of two tunnels, one to run approximately north and south and the other approximately east and west, the latter connecting with the present tunnel to the East Side. The tubes would deliver passengers beneath Exchange Place Plaza, where they would run parallel. That location would serve as the transfer point for all sub-surface lines. The total length of the two tunnels would be 2.832 miles, and the average cost of construction per mile would be \$5,714,000.

According to the plan the East Side tunnel would continue to carry its present trolley lines, and, in addition, it might carry the lines now using Washington bridge, which would be rerouted through Fox Point to enter the tube at Thayer Street.

It is believed that eventually the East Side tunnel will be continued to the Seekonk River, thus caring for all lines bound the East Side or to East Providence, and relieving Waterman and Angell Streets of trolley traffic. In such case the Fox Point section would also be relieved of all trolley traffic except that which originated therein.

Jitney Fight Renewed in Detroit

Jitney drivers are again operating in Detroit, Mich., unmolested after having been "written up" or taken to the automobile pound for any possible infraction of the traffic ordinance. The contempt case of the jitney drivers' associations against Police Commissioner William P. Rutledge and fourteen Detroit policemen is pending and the hearing is to be resumed on Aug. 10.

Last week Judge Dingeman of the Circuit Court issued an order restraining the police from interfering with the operation of the jitneys. When no longer permitted to keep the jitneys from taking on passengers at their regular loading stations as usual, the police commissioner placed traffic officers at the various points with instructions to give the drivers tickets for violating in any way the city traffic ordinances. This action is claimed by the attorney for the jitney drivers to be in contravention of the United States Supreme Court, the Michigan Supreme Court and the Circuit Court orders.

The writ of error issued by the United States Supreme Court stating that federal questions were involved in the case caused the Michigan Supreme Court to issue a stay of proceedings and to revive the original injunction issued by Judge Hunt in 1923, which allowed the jitneys to operate unmolested until the recent attempt of the police department to drive them off the street, following the ruling of the Michigan Supreme Court that the jitney ouster ordinance was valid.

Meanwhile a contract has been entered into between the Department of Street Railways and Thomas J. Doyle, representing Dodge Brothers, Inc., for a rental of 50 single-deck motor coaches, each with a seating capacity of 21 passengers; one double-deck 60-passenger coach and one single-deck 29-passenger coach. These buses will care for traffic formerly handled by the jitneys. The contract covers payment on a mileage basis, and in the case of the 21-passenger buses can be applied on the purchase price in event the department decides to buy them later. Forty of the buses are to be put on the Woodward Avenue run between the Detroit River and the Six-Mile Road. A statement issued by the Mayor following the meeting of the Mayor and the Street Railway Commission is quoted:

The operation of the jitneys has been a serious drain on the revenues of the Department of Street Railways. If we are to accept as correct the figures of the jitney associations, the D. S. R. has lost in a period of four years approximately \$6,000,000 of revenue, or an amount which would reduce by more than half the present outstanding indebtedness to the Detroit United Railway.

The Department of Street Railways is being asked daily to establish new routes in outlying territory. It is conducting many of these routes at a loss trying to serve the public. It needs additional buses and cars and funds to repair its tracks and foundations. If it is to give the public adequate service without increase of fares, it is entitled to receive all the revenue from passengers immediately tributary to its existing lines.

Further, it has been the policy of the present administration to establish new routes without asking for additional bond issues. It will be impossible to continue this policy if the courts permit unfair competition with the city lines.

Rate of Return a Stumbling Block at St. Louis

Mayor Victor J. Miller of St. Louis, Mo., has stated that he will insist upon a provision in the new franchise ordinance under which the St. Louis Public Service Company will operate when it takes over the property of the United Railways Company limiting the rate of return on the investment at not more than 6 per cent.

He declared that the next move in the negotiations is up to the company, and that when representatives of the reorganizers decide to accept a 6 per cent return and so notify him negotiations will be continued. Until that time, he said, there is nothing further to negotiate.

The reorganization committee contends a return of 7 per cent is necessary.

When the tentative draft of the service-at-cost franchise was made public by Mayor Miller a few weeks ago the rate of return to be allowed the company was left blank. In the tentative draft the valuation was also blank. Both sides have agreed to abide by the findings of experts of the State Public Service Commission covering this point.

Stagger Plan Nearer in New York

Tabulation was begun on Aug. 2 of traffic census statistics taken in New York City in connection with the effort to be made to stagger the hours of workers. Health Commissioner Harris has announced that figures on 20,000 workers a day can be tabulated. When they have all been classified the actual question of staggering their hours will be taken up with the employers. The tabulation work is the classifying of information about where each worker works, what time he leaves for work, what time he quits work and what routes he uses. After this has been accomplished, "action can then be taken to broaden the rush-hour periods so that passengers may travel in comparative safety and comfort." The success of the plan will, of course, depend upon the extent of the co-operation of the employers.

Seattle Cuts Railway Budget, While Employees Ask Raise

The finance committee of the City Council of Seattle, Wash., has asked the Municipal Railway Department to cut its budget estimate from \$6,618,405 to \$5,750,000.

Asked where the committee could make cuts, D. W. Henderson, general superintendent, said \$100,000 might be cut off by reducing the number of trainmen, \$100,000 from way and structures and \$100,000 from supplies. He explained that he had made no recommendation for revamping any more cars to the one-man type because of the cost.

In the meantime the City Council has under consideration a request from 1,200 street railway employees for increased wages. Trainmen ask that their compensation be advanced to 75 cents an hour, a 5-cent increase over the present wage; shop employees ask an increase from \$6 to \$6.25 a day to

\$7 and \$7.25, while track workers, now paid by the day, ask to be placed on a monthly basis.

Municipal Railway Employees Want More

An increase in wages of 40 cents a day for the four classes of employees of the San Francisco Municipal Railway, San Francisco, Cal., not affected by the recent raise for platform men is asked in a communication to the Board of Supervisors by the San Francisco Labor Council. The resolution asks that the Board of Supervisors request Mayor Rolph to ask the Board of Public Works to authorize the increase in pay. The four classes of workmen named are janitors, car repairers, trackmen and clerical employees. The request is based on the fact that the Board of Supervisors intended that all employees of the railway should be benefited when it adopted the resolution affecting the platform men.

Two-Man Cars Restored on Chicago Line

As a result of an investigation by the local transportation committee of the Chicago City Council into an alleged frequency of accidents on the 79th Street crosstown line of the Chicago Surface Lines, the company has agreed to replace the 26 one-man cars which it now operates over this line with standard two-man cars. The one-man cars were installed three years ago in order to give a more frequent headway, and the number of rides on this line has increased rapidly since then. Due to this fact and to the extreme narrowness of the thoroughfare the number of accidents recently has shown a large increase. Automobiles can pass street cars only at street intersections, thus increasing the hazard to passengers boarding and leaving cars at the front end.

Illinois Traction Building Belt Line Around Twin Cities

In compliance with an ordinance passed by the city of Champaign, Ill., which prohibits the hauling of freight through its streets, the Illinois Traction System has entered into a compact with the Illinois Central and the Wabash Railroads, giving the traction system a 6-mile belt line around the twin cities of Champaign and Urbana.

The two steam roads have agreed to electrify certain sections of their track and lease them to the electric line. Practically all of the wire has been strung and the Illinois Traction System is now constructing spur tracks to connect with the Wabash and Illinois Central tracks. Completion of the work, estimated to cost about \$200,000, is expected early in the fall.

By virtue of this arrangement, the traction system will be enabled to operate standard M.C.B. equipment over the entire length of the Danville Division and thus considerably increase its line haul. The new line will also accommodate longer trains and provide improved freight house and team track facilities.

Franchise at Louisville to Be Taken Up Again

It is expected that the new ordinance of the Louisville Railway, Louisville, Ky., introduced recently, will come up before the City Council for discussion or action in early August. The delay in considering the franchise grant has been due in part to the absence of Mayor A. A. Will.

Plans Being Matured for Construction of Illinois Roads

Permission to build the first railroad to enter Calhoun County, Illinois, has been asked of the Illinois Commerce Commission at Springfield, Ill., by promoters of the Alton, Quincy & Northern Electric Railroad. It will be a southern branch of the Quincy & Northeast Railway. Preliminary surveys have been run for the new line. It will be 120 miles between Alton, Ill., and Quincy, Ill., and tentative plans are to start construction within two years.

The new line has not definitely decided on its route through Madison and Jersey Counties out of Alton, but plans to bridge the Illinois River near its mouth at Grafton to enter Calhoun County and to cut backward southwest to the little town of Deerplain. Thence it will pursue a northerly direction.

It is proposed to handle both passenger and freight with a new type of Diesel electric engine.

Charles H. Petsch, New York, is head of both undertakings.

Two-Car Train Constructed by Twin City Company

Experiments are being conducted with a light-weight two-car train recently built by the Twin City Rapid Transit Company, Minneapolis, Minn. One of these cars was recently demonstrated in the Home Products Show held in St. Paul and mentioned briefly in the issue of ELECTRIC RAILWAY JOURNAL for July 3. It is planned to place additional units such as those which constitute this train into service in the Twin Cities, with certain modifications in their general construction, if the results of the tests now being conducted are satisfactory.

Restoration of Intercity Service Urged at Kansas City

The Chamber of Commerce of Kansas City, Mo., will urge a restoration of electric railway service between Kansas City, Mo., and Kansas City, Kan., via the Eighth Street tunnel through the construction of an incline. The chamber has been working for relief in railway service conditions for workers in the district since the condemnation of the viaduct as unsafe on Dec. 29, 1922. The matter was considered by the Public Improvement Committee because it was coupled with a second proposal for a new tunnel for vehicular traffic to join with Eighth Street and afford a new trafficway into the district. No action was taken on the latter project pending more complete information.

Board Appointed to Arbitrate Chicago Elevated Wage Dispute

Submission of the demands of Chicago elevated trainmen for a wage increase of 5 cents an hour over the present scale of from 72 to 77 cents an hour as well as the counter proposal made by the Chicago Rapid Transit Company for a reduction of 5 cents an hour to immediate arbitration was agreed upon by both factions at a meeting during the week ended Aug. 7.

The Elevated Railway employees' union selected Maclay Hoyne as its representative in the mediations. Bernard J. Fallon, vice-president of the Chicago Rapid Transit Company, was designated representative for the employers. It was announced that in the event the two arbiters cannot agree on any point they shall select a third man.

Trainmen and shopmen of the Chicago Surface Lines, who have asked similar increases, have declared that they will await the outcome of the elevated arbitration hearings before negotiating any further.

Fare Case at Rome Concluded

Public Service Commissioner Lunn on Aug. 3 closed for determination the petition of the New York State Railways for permission to increase its fare rates in the city of Rome. The city and the railroad were allowed two weeks in which to file briefs. At the request of the city the commission will send an engineer to Rome to inspect the condition of the company's tracks and equipment in the city.

News Notes

Franchise Survey Ordered in San Francisco.—A survey of the franchises of the Market Street Railway and other non-municipal lines operating in San Francisco, Cal., has been ordered by the Board of Supervisors, which has passed a resolution introduced by Supervisor John B. Badaracco. Following the passage of the resolution, Mr. Badaracco announced that when the survey is completed he will move for an immediate evaluation of all the non-municipal lines.

Cheaper to Purchase Power for Ohio Line.—Abandonment of its only remaining power plant and the purchase of current from the Union Gas & Electric Company, is a proposal which has been submitted to directors of the Cincinnati Street Railway, Cincinnati, Ohio. The power plant in question is known as the Pendleton Station. It has been in operation for more than twenty years. Officials of the railway contend that the power can be purchased cheaper from the utility power company than it can be produced in their own establishment.

Sunday Excursions on Pittsburgh Lines.—Excursions to Washington, Pa., and intermediate points, with reduced rates, were started a few weeks ago on the Washington interurban lines of the Pittsburgh Railways, Pittsburgh, Pa.

Inducements to visit historic spots along the Washington and Charleroi lines, by reductions in fares on Sundays, persuaded many car-riders to leave their week-day haunts.

Single-Door Cars in Baltimore to Go.—Steps have been taken by the United Railways & Electric Company, Baltimore, to discontinue the use of all its single-door one-man cars. Eighteen of the 33 that have been in operation have been sold and efforts will be made to dispose of the remaining fifteen. The double-door one-man cars, however, will be kept in service.

Rehearing on Franchise Granted Albany Company.—On July 30 the Public Service Commission granted the application of the United Traction Company Albany, N. Y., for a rehearing of the commission's holdings over franchise provisions in Rensselaer and Troy which are under consideration on the company's petition for an increase in rates of fare in the various cities served. The rehearing will be held at Albany on Aug. 11.

Increased Rates Sought.—The York Utilities Company, Sanford, Me., has applied to the Public Utilities Commission at Augusta for authority to increase freight and passenger rates on certain of its railway lines. The company operates an electric line connecting Springvale, Sanford, Kennebunk and Biddeford. The fare between Springvale and Sanford is at present 5 cents. The company wishes to increase the rate to 10 cents.

East St. Louis Employees Awarded Increase.—Employees of the East St. Louis & Suburban Railway, East St. Louis, Ill. have been awarded a flat increase of 2 cents an hour retroactive to May 1 by a board of arbitration which was appointed to investigate the question of increased wages when the wage contract expired at midnight on April 30. The increase affects about 700 employees in various classifications, including motormen, conductors and shopmen, bringing the top wage to 59 cents an hour. About \$9,000 in back wages will be paid them. The arbitration board reached its decision on July 24 and the results were made public on July 26. The question of wages was the only point of difference between the company and the employees.

Reduced Fare in Pittsburgh.—Effective July 24, 1926, a 5-cent fare was put into effect on Route No. 94 of the Pittsburgh Railways, Pittsburgh, Pa., between 62d Street loop and Aspinwall. No transfers will be issued on this fare. The regular token fare of 8½ cents will continue to be in effect and car riders are entitled to transfers by paying the 8½-cent fare.

Special Rate for Children.—The New York Transit Commission has announced approval of a 10-cent round-trip fare for children's outings on the New York, Westchester & Boston Railroad between the Harlem River and Baychester Avenue stations. The present fare is 7 cents each way. The new rate is available only for parties of children being escorted to the playgrounds by community organizations, civic associations, charitable institutions and the like.

Foreign News

Making London Trams Comfortable

Cushioned seats are being tried out on one of the cars of the Metropolitan Electric Tramways, which is one of the companies in the London underground group. The seats are placed transversely and have reversible backs. They are covered in Moquette of a pleasing design of fawn and blue. Rubber flooring is also used on the lower deck in place of the usual slats. The lighting has been improved by a 50 per cent increase in units. Special shades are used to insure even distribution of light and to avoid glare. The interior decoration of the car is carried out in light oak and white enamel. Staircases to the upper deck have also been redesigned for safety and ease in ascent. These changes have been made as the result of competition from the buses. If successful, they probably will be adopted as standards for use by the railway.

New Zealand Issues Regulations for Buses

Revised regulations of the Board of Trade of the Division of New Zealand as regards motor buses took effect May 7. One of the principal clauses is that relating to fares to be charged between any two places which are also served by a tramway or trackless trolley. A clause of the new act provides that in such cases the bus fare must be at least 2d. more than the corresponding tramway or trackless trolley fare. Where the route only partly parallels a tram line the bus fare must be at least equal to that of the tram line for the distance covered.

All bus operators must secure a license showing that there are no other adequate means of transport on the route proposed. They must file a liability bond of £2,000 for damages to any single person and £500 per passenger for the carrying capacity of the bus, with a minimum limit of £3,500. The bus and equipment must be of an approved type and the operator's license may be revoked if the authorities consider the operator unfit to hold such a license.

South Shields Tramways Shows Profit

The county borough of South Shields, England, for the year ended March 31, 1926, shows net revenue or profit from operation of £21,413, as compared with £14,590 last year. After interest and amortization were deducted, the net income this year is £3,084, as compared with a deficit of £2,262 last year. There was a loss in gross revenue, but the operating expenses were decreased by a much larger amount. The tramcar mileage was 1,126,034 and the bus mileage was 117,028. J. Austin Baker, the present manager and engineer, has been in charge since April, 1925. Previously

he was technical assistant to the electrical and rolling stock engineer of the Manchester City Tramways.

South African Tramway Systems.—Eleven tramway systems now operate in South Africa, including two trackless trolleys. Greater proportionate profit is shown by the four companies owned and operated by private interests than by the seven controlled by municipalities. According to a recent report, statistics of the combined companies are, for the years 1924-25: Passengers carried, 138,048,233; car-miles run, 14,431,151; persons employed, 3,472. Johannesburg has just put into service the first tram car constructed in entirety in South Africa. Heretofore, certain parts, such as trucks and motors have been imported. During 1924 imports of tramway materials for operation and construction purposes were valued at £94,492, of which £71,293 came from the United Kingdom and £23,059 from the United States.

Ground Broken for Bermuda Railway.—The Bermuda Light Railway will now put into effect its franchise granted to run its line from one end of the island to the other, even though the House of Assembly refused to insert the clause that motor transportation be barred for 40 years. It is hoped that the road will be completed within two years.

Tramway and Bus Advertising in Peru.—Car card advertising is taking hold rapidly in Lima, Peru. Both the Lima Tramway and the independent buses are selling space in their vehicles. This is a new venture and the cards are printed locally. A few foreign advertisements have appeared, but there is much room for improvement in appearance.

Berlin Line Earns 7 per cent.—The Berlin Overhead & Underground Railways, reports that for 1925 its balance sheet shows a gross profit of 24,380,000 marks. After deducting various expenses, including 12,700,000 marks for taxes and administration, there remains a net profit of 8,800,000 marks, out of which a 7 per cent dividend is paid and 739,290 marks are carried forward.

Car with Worm Drive.—Experiment is being made by the Halifax Corporation Tramways with a single-deck car fitted with worm drive instead of ordinary gears. It is a light-weight, low-floor car with 25-in. wheels, and seats 36 passengers. Noise reduction has been given particular attention.

Subway Planned for Tokyo.—Plans for subway construction in Tokyo at an estimated cost of 187,485,959 yen (approximately \$80,620,000) have been completed. The expenditures will extend over a period of thirteen years, commencing with the fiscal year ending March 31, 1927, and terminating March 31, 1939. It is proposed to finance this project with loans aggregating 240,000,000 yen, to be issued each year in the amounts required.

Revival of Half-penny Fares.—Pre-war half-penny fares are proposed for short journeys by the Aberdeen Tramway companies in Scotland. The zones are to include about 1,000 yd. Other pre-war reductions are being considered, such as season tickets, etc.

Recent Bus Developments

Buses to Be Replaced by Cars in Alliance

Officials of the Stark Electric Railroad, Alliance, Ohio, have completed plans to withdraw buses on Sept. 20 and return to railway service. They say city bus service is not profitable.

Nine months ago the Stark Electric put on buses to replace antiquated street cars which were being operated at a loss. Additional service was offered residents of the city, but the routes failed to produce the revenue expected by company officials.

Shortly after permission was secured from the City Council, to operate buses, the Stark Electric was taken over by New York capitalists. Although the belief was held that buses would not pay, service has been continued by the new owners.

Next month, six city bus routes will be discontinued and railway service again adopted in the city.

The request of the company for permission to increase car and bus fares from 7 to 8 cents was refused by the City Council. Shortly after presenting the request for the increased fare, officials of the railway announced plans for discontinuing bus service.

Buffalo-Niagara Falls Bus-Line Proposed

The International Bus Corporation, Buffalo, N. Y., applied on July 27 to the Public Service Commission for a certificate for the operation of a bus line between Buffalo and Niagara Falls under consents received from the municipalities through which the proposed bus line will pass.

The company says that adequate service in the transportation of persons and property on interurban electric railroad cars and trains is being furnished to the public upon the high speed line of the International Railway, but that there has come with the development of motor vehicle transportation by means of high class buses a demand among certain classes of travelers for that kind of transportation. In the opinion of the petitioner, many persons would prefer to patronize a bus line and to pay for such transportation a fare greater than that now charged upon the interurban line. This demand the petitioner desires to fill by the proposed operation.

Inasmuch as the proposed bus and motor vehicle line and route will in a measure compete with the high speed line of the International Railway, the new company deems it appropriate that these additional transportation facilities shall be furnished by it as a subsidiary of the International Railway. The proposed line may also compete with the New York Central Railroad, but the petitioner holds that the different character of service to be rendered and the fact that the buses will carry passengers direct, without transfer to

the territories through which the route will extend will make such competition, if it exists at all, inconsiderable.

Charters for Bus Lines Sought by Pennsylvania Steam Roads

Charter applications of the Reading Transportation Company and the Pennsylvania General Transit Company have been referred to the Attorney-General of Pennsylvania for a "thorough investigation," the companies seek charters for the operation of buses and trucks. The Public Service Commission announced its approval of the applications, but before a charter may be issued it must bear the Governor's approval. However, approval of the commission carried with it a provision making it obligatory for the companies to have the commission's approval for each individual route proposed.

The application of the Reading Transportation Company seeks charter rights in twenty-four counties and that of the Pennsylvania General Transit Company in 55 counties.

One of the companies will be affiliated with the Reading Railroad and the other with the Pennsylvania Railroad, both steam railroads. As explained previously in the *ELECTRIC RAILWAY JOURNAL*, more particularly the issue of July 24, page 160, the rights sought by the Reading Company were opposed by the electric railways on the ground that the system of routes outlined for operation by that company contemplated the use of buses by the company in territory that would bring the service into competition with the electric railways.

Adjunct to Gray Line in Colorado Springs

David P. Strickler, president of the Colorado Springs & Interurban Railway, Colorado Springs, Col., has completed negotiations with officials of the Gray Line Corporation for a new bus unit which will link the Pike's Peak region with the co-operative sightseeing transportation service. New equipment will be purchased by the Colorado Springs & Interurban company, which will give the tramway a fleet of the finest cross-country sightseeing buses manufactured. Points of interest in the entire state will be the realm of the new organization.

The new Broadmoor-Stratton Park-Manitou sightseeing route of the Colorado Springs & Interurban Railway, upon which three new buses will operate will be a part of the new Gray Line service. The three buses will be emblazoned with the insignia of the Gray line before they are put into service.

The Gray Line is a co-operative sight-seeing service and transportation organization composed of innumerable units in this country, Canada and abroad. All units closely interlock and each sends its clients to the Gray Line

of the city to which the travelers are going. The Gray Line is in short a series of small units, each operated by an independent company, and all running according to the standards laid down by the head of the company.

The prospective extent of the new Gray Line unit at Colorado Springs has not yet been decided, Mr. Strickler stated. This will be taken up in detail at a meeting to be held later.

Union Opposes San Francisco Bus Grant

Action on the granting of a franchise for a new privately owned bus line in the Mission district of San Francisco, Cal., has been postponed by the city authorities pending further investigation of the city's rights in the matter. W. J. Gaffney, applicant for the franchise, made a modified proposal in which he said that he and his associates would give the city a chance to acquire the line before any other agency, should the original owners at any time decide to dispose of it. The franchise was opposed by John O'Connell, secretary of the Labor Council, and by Edward D. Vandellur, president of the platform men's union of the Municipal Railway.

Buses Substituted for Dover Cars

The Public Service Commission of New Hampshire has authorized the substitution of bus service on all lines of the Dover, Somersworth & Rochester Street Railway, Dover, N. H. The commission ordered the change July 20. Announcement of the railway company's petition to make this substitution was made in the *ELECTRIC RAILWAY JOURNAL* of April 3.

Bus Operation Curtailed by Indiana Road

The Interstate Public Service Company, operating traction and bus lines from Indianapolis south to Louisville, has been authorized by the Indiana Public Service Commission to suspend bus operation between Franklin and Columbus, Ind., and to abandon operation of buses on its through line between Indianapolis and Louisville, and on its line between Seymour and Jeffersonville. This will leave the company operating bus lines only between Indianapolis and Franklin and between Columbus and Seymour. The operation of buses between Franklin and Columbus is expected to be resumed when the paving between those cities is completed. The company sought this relief because the lines were being operated at a loss.

Bus Line Authorized in Iowa

The Iowa Railroad Commission has authorized the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa, to operate motor carriers between Harcourt and Rockwell City, and its associated company, the Fort Dodge, Des Moines & Southern Transportation company, Fort Dodge, Iowa, to establish a Fort Dodge-Spence bus line, but permit for a similar line between Spirit Lake and Spencer was denied.

Railway Receivers to Turn Bus to Advantage

William H. Riley and Edwin M. Walker, equity receivers of the Binghamton Railway, Binghamton, N. Y., have applied to Federal Judge Frank Cooper, in United States District Court, for an order allowing the railway to take over the lines of the Triple Cities Bus Lines, Inc., formed by Edward J. Dorey, who also is the directing head.

The bus lines would be taken over by the Binghamton Railway Bus Lines, Inc., a subsidiary corporation and in preparation for this, the Binghamton Railway Bus Lines, Inc., has filed a certificate of incorporation.

Four bus passenger routes are contemplated, extending through the Third and Fourth Wards, Johnson City, Endicott, Vestal, Willow Point and intermediate points and touching the Town of Dickinson on the north.

Judge Cooper is expected to approve the petition of the receivers. The next move will be to apply to the Public Service Commission for permission to take over the Dorey lines and for permission to exercise the franchises for the Third and Fourth Wards purchased at the city of Binghamton public auction a few weeks ago.

Specifically, the petition put before Judge Cooper by the equity receivers was for permission on the part of the Binghamton Railway Bus Lines, Inc., to lease the Dorey lines for a period of five months with the privilege of buying the business outright at the expiration of that time.

Mr. Riley stated that the Dorey lines will be taken over before Aug. 10 and operated by the railway. By Sept. 1, he declared, the new bus system will be in complete operation.

Eight buses used now by the Dorey lines will be added to the present railway bus equipment. That will be sufficient to operate the four routes to be established.

There is no consideration or price stipulated at present, for the leasing privilege. But the equity receivers guarantee the payments, as they fall due, on condition sales contracts for certain buses used by the Dorey lines.

Rival Bus Company Bought Out by Tacoma Railway

Fourteen buses of the Puget Transportation Company, operating on various streets served by the railway, have ceased operations following completion of negotiations for purchase of the transportation company's preferred stock by the Tacoma Railway & Power Company. An agreement now under way will protect the preferred stockholders, it is stated, and in some measure the creditors of the organization.

Note was made in the *ELECTRIC RAILWAY JOURNAL* of July 3 of the bus company's attitude that the City Council was within its rights in revoking its operating permits and that it had no desire to cause friction in the attempt to solve the transportation problem.

Supplementing the service into the districts beyond the end of the street car lines, the railway company plans to institute bus service. It has purchased

a number of former jitneys and withdrawn them from service, and some of these cars will be used in the bus service. The company has now taken over 21 buses.

Competitive Rights Refused

The Pennsylvania Public Service Commission has denied an applicant the privilege of running a passenger bus service between Bangor and Nazareth through the Wind Gap. The opposition came not primarily from the railway with which the bus line would have competed but from the borough authorities of Wind Gap. They feared that the operation of the buses would mean the eventual removal of the surface tracks and the abandonment of the trolley service.

Decision Awaited on Western Motor Coach Petition

All evidence bearing on the petition of the Western Motor Coach Company to operate buses from the western city limits along Jackson Boulevard to the Wells Street terminal of the Chicago, Aurora & Elgin Railroad in Chicago, and from the city limits westward to Aurora, Elgin and Geneva, was taken at the final hearing conducted by the Illinois Commerce Commission in Chicago recently.

Opposition to the project was voiced by representatives of the cities of LaGrange, Oak Park and Maywood, who maintained that the territory is already adequately served by three steam railroads. It was further contended that the operation of additional buses would aggravate the already serious congestion on the main highways traversing this district.

The coach routes, according to the petition, are designed to feed an supplement train service on the Chicago, Aurora & Elgin Railroad, which line they will closely parallel.

Buses Proposed for Berkeley, Cal.

A system of bus lines, augmenting the street cars in Berkeley, Cal., is proposed as a method of solving the transportation problems of that city. The removal of the Key Division trains from Shattuck Avenue is understood to be the basis of all of the plans now being studied. The specific plan that will finally be presented to the City Council has not yet been drafted, according to the officials, and the Key officials refused to discuss the matter until City Manager Edy has acted.

Bus Experiment in Wisconsin Town

Manitowoc began its three months test of city-wide bus service on July 19, replacing the street cars of the Wisconsin Public Service Corporation. Under this experimental bus plan there will be an increase in fares, seven tickets selling for 50 cents and cash fares 10 cents. A charge of 4 cents will be made for transfers from the Two Rivers-Manitowoc interurban railway to city buses.

Financial and Corporate

Non-Recurrent Income Helps Interborough

For the twelve months ended June 30, 1926, the total revenue of the Interborough Rapid Transit Company, New York, from all sources was \$61,985,794, an increase of \$3,274,602 over the preceding year. This increase is due in part to the receipt of approximately \$1,167,000 additional growing out of the new advertising contract which became effective last November. Of this increase in advertising receipts \$770,000 was due to a lump sum payment upon the signing of the contract, against which no similar payments are to be made in subsequent years. Operating expenses, taxes and rentals paid to the city for the old subway increased \$2,951. Income deductions increased \$482,448.

The net result for the twelve months was a surplus of \$2,443,694. This represents an improvement of \$2,789,203 over the preceding year, due to a large extent to the new advertising contract.

Frank Hedley, president and general manager notes that all available balances must be utilized for the old debts and outstanding obligations. These are mainly unpaid taxes, cost of new cars and certain contractual obligations.

The cost of the strike just ended, is not reflected in these figures. This loss will show in the July statement and will, of course, represent an additional and unexpected drain on the balance for the year ended June 30.

It is explained that from the commencement of operations under Contract No. 3 and the related certificates respectively it has been the practice to include in all reports of operating expenses 14 per cent of the gross operating revenue upon the Manhattan division and 17 per cent on the subway division, to cover maintenance and depreciation. These are the percentages

fixed for the first year of operation in each case. Negotiations have been pending between the company and the Public Service Commission ever since the end of the first year to determine what, if any, changes in these percentages should be made for subsequent years. Prior to July 1, 1923, the amount expended in excess of 14 per cent upon the Manhattan was approximately offset by the amount under 17 per cent expended upon the subway division. The net expenditures for maintenance in excess of the amounts therefor included in "operating expenses, taxes and rental paid city for the old subway" are shown as "maintenance in excess of contractual provisions."

Traffic, Fare and Wage Figures Reported

The month of June continued the record of improvement in electric railway traffic in 1926 over 1925 that has been returned every month since the beginning of the year. The number of revenue passengers, including bus passengers, reported by the American Electric Railway Association for 206 companies in June, 1926, compared with June, 1925, was as follows:

June, 1926	780,549,894
June, 1925	766,449,184
Increase	1.84%

Average cash fare in cities of 25,000 population and over:

July 1, 1926	7.6946c.
June 1, 1926	7.6946c.
July 1, 1925	7.5551c.

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 miles or more of single track:

	Average Hourly Rate	Index Number 1913=100%
July 1, 1926	56.77	208.33
June 1, 1926	56.75	208.26
July 1, 1925	56.27	206.50

Steady Gain for Twin City Company

Net income of the Twin City Rapid Transit Company, Minneapolis, Minn., for the first half of 1926 shows a gain of \$64,222 over the similar period for 1925, the total being \$722,445, or \$2.80 a share on the common stock after preferred dividends. Last year this was \$2.51. T. Julian McGill, vice-president, said:

If our present rate is continued through the year I believe the return will be 7 per cent on the preferred and 5 per cent on the common stock, as authorized by the State Railroad and Warehouse Commission. The increase is due entirely to the increase in fare from 6 to 6½ cents. There has been a decrease in passenger haul of 7 per cent since the fare was raised, but the difference in fare more than compensates the lighter business.

The rate of fare was increased to 8 cents cash with tokens remaining at 6 cents on Aug. 1, 1925, and Jan. 1, 1926, the rate became 8 cents cash and 6 tokens for 40 cents, or 6½ cents.

Net income of the Minneapolis Street Railway division for the second quarter of 1926 was \$188,417, or a gain of \$16,475 over the like period for 1925. Gross operating revenues for the quarter were \$1,900,407, an increase of \$66,437 over last year. Operating expenses were \$1,294,749, compared with \$1,256,344. Net operating revenue was \$605,657 compared with \$577,626 in 1925.

The income of the St. Paul City Railway for the first half of the year showed a gain of 18 per cent, reaching a total of \$376,556 gross income compared with \$307,155. Total operating revenue was \$2,356,499 compared with \$1,778,724 operating expense.

STATEMENT OF TWIN CITY RAPID TRANSIT COMPANY FOR SIX MONTHS

	1926	1925	Per Cent Inc. or Dec.
Gross revenues	\$6,597,165	\$6,384,466	+03.33
Operating expenses	4,746,786	4,599,710	+03.20
Net revenue	1,850,378	1,784,755	+03.68
Fixed charges and taxes	1,127,933	1,126,531	+00.12
Net income	722,445	658,223	+09.76

Terms of Providence Merger Plan

Interests identified with Bodell & Company, Providence, R. I.; Harris, Forbes & Company, Boston, and the First National Bank, Boston, have announced a plan under which the Narragansett Electric Lighting Company and the United Electric Railways, Providence, may be consolidated if the necessary approvals of stockholders and the public authorities are obtained. It is proposed that the Narragansett company be acquired by the recently created United Electric Power Company, all the stock of which will be owned by the Rhode Island Public Service Company, a new corporation, and the last-named will also hold such stock of the railway as is exchanged under the plan.

In an announcement by the Rhode Island Public Service Company it is pointed out that the plan strengthens to a considerable degree the position of the bonds of the United Electric Railways. The market of the bonds will be benefited by the association of the lighting and power property and the railway.

STATEMENT OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY

	Twelve Months Ended June 30, 1926	Comparison with Twelve Months Ended June 30, 1925 Increase
Total revenue	\$61,985,794	\$3,274,602
(A) Operating expenses, taxes and rentals paid city for the old subway	39,564,781	513,901
	\$22,439,012	\$2,760,701
(A) Maintenance in excess of contractual provisions	981,345	610,960
Income available for all purposes	\$21,457,666	\$3,271,651
Fixed charges:		
Interest on I. R. T. first mortgage 5 per cent bonds	\$8,074,066	\$3,104
Interest on Manhattan Railway bonds	1,808,240	.....
Interest on I. R. T. 7 per cent secured notes	2,379,073	3,211
Interest on I. R. T. 6 per cent ten-year notes	526,899	128,726
Interest on equipment trust certificates	291,321	121,899
Miscellaneous income deductions	414,131	12,512
Sinking fund on I. R. T. first mortgage 5 per cent bonds	2,453,753	236,673
Total	\$15,947,485	\$481,272
	\$5,510,180	\$2,790,379
Dividend rental at 7 per cent on capital stock of Manhattan Railway not assenting to the "plan of readjustment"	\$232,701	\$1,069
Dividend rental on Manhattan Railway stock under the "plan of readjustment"	2,833,785	106
	\$3,066,486	\$1,176
Balance after actual maintenance	\$2,443,694	\$2,789,203

Figures in italic denote decrease.

\$5,000,000 Bonds of Dallas Railway Offered Publicly

At a recent meeting of the directors of the Dallas Railway, Dallas, Tex., an amendment to its charter was authorized changing the name to the Dallas Railway & Terminal Company. The directors also adopted a refinancing program which provides that 10,000 shares of preferred stock and 10,000 shares of common stock will be issued, with a par value of \$100. The sale of \$5,000,000 first mortgage bonds was approved.

The issuance of the new securities will enable the company to pay off past due mortgages and notes and place the company upon a financial basis that is expected to enable it to meet the growing transportation needs of Dallas.

The company operates, under a modern franchise, the entire electric railway service in the city of Dallas, Tex., serving a population estimated at about 250,000. The company also owns and operates a modern eight-story terminal station and office building near the center of the business district of the city. In addition the company operates under lease the electric railway serving that part of Dallas known as Oak Cliff.

The earnings of the company for the four years ended Dec. 31, 1925, were as follows:

Year	Gross Earnings	Operating Expenses, Including Maintenance, Taxes and Rentals	Net Earnings
1922	\$3,270,827	\$2,532,958	\$737,869
1923	3,330,425	2,632,349	698,076
1924	3,322,215	2,547,246	774,969
1925	3,429,298	2,578,079	851,219

The bonds will be secured by a direct first mortgage on all the company's property and equipment, including the terminal building. The principal amount of the \$5,000,000 bonds to be issued is less than 60 per cent of the value of the company's wholly owned property as of May 31, 1926, as established under the franchise for rate-making purposes.

A syndicate in which Tucker, Anthony & Company, the Old Colony Corporation, Halsey, Stuart & Company and W. C. Langley participated offered the bonds on July 23 at 96½ and interest to yield 6.25 per cent.

Cuban Deal Approved

Stockholders of the Havana Electric Railway, Light & Power Company, Havana, Cuba, have approved the plan to merge the company with Cuban Utilities Company. The new company is to be known as Havana Electric Railway, Light & Power Company. The Cuban Utilities Company, in addition to owning the electric railway systems in Santiago and Camaguey, Cuba, owned more than 86 per cent of the preferred and more than 98 per cent of the common stock of the old Havana Electric Railway, Light & Power Company. Consequently the merger brings together the electric power and light, gas and railway properties in Havana, and the electric railway properties in Santiago and Camaguey. Substantially all the stock of the new company is owned by the Havana Electric & Utilities Company. The electric railway systems

in Santiago and Camaguey now owned by the new Havana Electric Railway, Light & Power Company were acquired by Cuban Utilities Company from subsidiary interests of American & Foreign Power Company, Inc., operating in Cuba.

Dividend Cut by New Bedford Road

The Union Street Railway, New Bedford, Mass., has halved its dividend, current declaration being on \$4 annual basis. With the textile situation in the doldrums and bus competition on the increase, the company decided to conserve assets. For years it paid 8 per cent annually on its \$2,437,500 stock.

Receivership for Sharon-New Castle Road

Rufus Moses has been appointed receiver of the Sharon & New Castle Street Railway, New Castle, Pa., by Judge Gibson in the United States District Court.

The appointment was made at the request of the New York Trust Company, which filed an equity suit against the railway to recover interest on \$120,000 of first mortgage bonds, issued by the railway in 1901.

The appointment of a receiver was by mutual consent of the defendant concern and the New York Trust Company, which, as trustee for the bondholders, cited in its bill of complaint that no interest had been paid on any of the bonds since January, 1903.

The present action is a friendly one as explained in the *ELECTRIC RAILWAY JOURNAL* for July 24, page 162.

Insulls Buy Into National Electric Power

Announcement has been made that Insull Son & Company, Inc., have purchased an interest in the common stock of the National Electric Power Company and that the company would be continued as organized, with Victor Emanuel as vice-president.

The principal New England property controlled by the Emanuel interests, is the Cumberland County Power & Light Company. It is expected that this will be merged with the New England Public Service Company, an Insull organization, thus further strengthening the Insull interests that already dominate in New Hampshire, Maine and Vermont.

Albert Emanuel, president of the National Electric, is in retirement, and Victor Emanuel has been the acting head of the company for several years.

The Cumberland County Power & Light Company provides all electric light and power for Portland and vicinity. It also operates the street railway in Portland.

Representatives of the Insull interests in Chicago described as an investment the acquisition of a common stock interest in the National Electric Power Company by Insull Son & Company, Inc. The latter is an Illinois corporation formed two years ago to do a financial business with Samuel Insull, chairman of the board, and his brother, Martin J. Insull, as president.

Maryland Interurban Sold at Foreclosure

The property, franchise and equipment of the Cumberland & Westernport Electric Railway, Cumberland, Md., in Allegany County, have been sold at trustees' sale for \$50,000 to R. H. Koch, Paul L. Hitchins and F. Brooke Whiting, a committee representing the bondholders.

It is stated that the purchasers will reorganize the company and continue operation by trolley from Cumberland to Frostburg and by bus between Frostburg and Westernport.

The line was offered in four parcels. This is the way it was organized prior to the merger in 1906. The first parcel, between Westernport and Lonaconing, was bid in at \$17,000; the second parcel, the franchise and property between Lonaconing and Frostburg, brought \$12,000; a third parcel, the line between Frostburg and Narrows Park, \$10,000, and the fourth parcel, consisting largely of buildings and local freight stations, brought only \$10,000, or a total of \$49,000. When the property was offered in its entirety the bid of \$50,000 of the bondholders' committee was not raised.

The company's franchise covers the right to run from Narrows Park to Frostburg and thence to Westernport, through the George's Creek Valley. The trackage between Frostburg and Westernport has been abandoned in the last year and traffic has been handled in buses. The company has a trackage agreement with the Potomac Edison Company to operate the Frostburg cars into Cumberland. It owns power houses and carhouses at Clarysville and Reynolds.

Upon a petition of the Real Estate Trust Company, Philadelphia, Pa., a decree was passed by the Circuit Court on June 17 naming trustees and ordering the sale.

Washington-Virginia Road Near the End

Receivers for the Washington-Virginia Railway, Washington, D. C., have announced their intention of closing up the affairs of the company at the earliest possible moment, but are said to have made known their willingness to consider sale of the system—rolling stock, carhouses, buses and all—on the basis of their scrap value.

The disclosure was made by F. W. Woodcock, representing the receivership, at a meeting in Alexandria of a special citizens' committee formed to seek continuance of the railway's operation, even though it should be sold for "scrap."

Preliminary intimation of the agreement of the receivers to wind up the affairs of the company was given some time ago at a meeting in Alexandria of interested parties, called at the instance of Day & Zimmermann, operating engineers, of Philadelphia, who are advisers in the receivership. At that time Mr. Woodcock is said to have declared that the receivership must end shortly, since the revenues had been badly depleted by bus competition, and the road was barely paying expenses.

A committee was then appointed to

confer on the matter, and attempt to reach a solution as to the disposition that might be made of the company's property. This committee met again a few days ago, with Mr. Woodcock again present. Formal organization of the group for the purposes outlined was effected.

Chairman Church announced after the meeting that Mr. Woodcock had assured the committee that any proposal to purchase the road with a view to continuing its operation would be entertained by the receivers on basis of "scrap" valuation of \$750,000, as estimated by the road's engineers.

Financial Plan of Danbury Company Approved

The Danbury Power & Traction Company, Danbury, Conn., formerly identified under the name of the Danbury & Bethel Traction Company and the Danbury & Bethel Street Railway, has been authorized to issue \$500,000 of 6 per cent bonds and also 5,000 shares of common stock without stated par value. The latest decision of the Public Utility Commission supersedes a previous finding and allows changes in the capital structure of the company to provide for the purchase of the franchise and property rights of the Danbury & Bethel Traction Company.

The new company will continue to operate a street railway and bus service, and is further allowed to distribute electric power. The railway has been in the hands of Receiver Edward M. Bradley. In acquiring control the Danbury Power & Traction Company proposes to deliver in payment \$400,000 in first mortgage bonds and virtually the whole of the 5,000 shares of capital stock without nominal value. The proceeds of the balance of the authorized issue of stock, amounting to \$100,000, will be used for improvements and additions.

Concluding Ohio Traction Deal

Holders of preferred stock of the Ohio Traction Company, Cincinnati, Ohio who are not disposed to deposit their stock under the plan of the committees of the common and preferred shareholders will receive \$70 a share for their holdings. This was made known in a letter sent out by E. C. Bernhold, secretary of the company. Attention was called to the fact that at the recent meeting of the stockholders to ratify and confirm the purchase of the assets of the Ohio Traction Company 168,714 shares were voted in favor of the plan and 246 against the agreement. More than 90 per cent of both classes of stock have been deposited with the Western Bank & Trust Company. Stockholders who have withheld may deposit their stock until the deal is concluded.

It is expected that the plan for the liquidation of the company's properties will be completed within a short time. Stock which is not to be deposited should be surrendered without delay the letter states.

The assets of the Ohio Traction Company will be converted to the Cincinnati Car Company, which will have jur-

isdiction over all the properties formerly held by that company. The Ohio Traction Company owned the Cincinnati Traction Company, which until last fall operated the electric railway system in Cincinnati under lease.

Merger Plan in Indiana Approved

Purchase of four electric railway and light and power properties in northwestern Indiana by the Indiana Service Corporation has been authorized by the Indiana Public Service Commission. The properties which pass in the transaction are the Marion & Bluffton Traction Company, both railway and power property; the Bryant Electric Company, the Wells County Electric Company and the Berne Electric Company. The total valuation placed by the commission on these utilities was \$1,295,992. By this transaction the corporation will serve 39 communities with electric light and power service and 37 towns will be connected by the company's electric railroad lines. The transaction is to be in cash or by the exchange of no par common stock of the Indiana Service Corporation for stock in the selling companies. To complete the transaction, the commission authorized the Service corporation to issue 76,000 shares of no par common stock. The order provides that the reserves which have accrued for depreciation and other purposes be kept separate for the benefit of the individual properties.

Chicago City Railway Bond Interest.

—Announcement was made that interest on the first mortgage 5 per cent bonds of the Chicago City Railway and Calumet & South Chicago Railway deposited under the bondholders' protective agreements would be paid on Aug. 1. Coupons due on that date will be detached from deposited bonds, collected and checks sent to registered holders of certificates of deposit as of Aug. 1 next upon receipt of ownership certificates or authority to sign them by the First Trust & Savings Bank, Chicago, the depository.

Authority Sought to Issue \$351,000 in Notes.—Authority to issue notes totaling \$351,000 to be used in the purchase of land and in the construction and equipment of substations is asked in a petition filed with the Indiana Public Service Commission by the Indianapolis Street Railway. Construction of the substations, the company claims, would result in faster operation of the cars, more dependable operation and a saving of energy. Eighteen notes of \$5,500 each will carry an interest rate of 7 per cent and the rest 6 per cent.

Security Hearing Put Over Indefinitely.—The hearing on the application of the Wyandotte Railways, Kansas City, Kan., to permit it to issue securities totaling \$1,750,000, scheduled for the week ended July 24, has been postponed indefinitely by the Kansas Public Service Commission. The company desires to issue first mortgage bonds on its property in Wyandotte County. This company will take over under reorganization the lines of the present Kansas City Railways in Kansas City, Kan.

Line Abandoned as Economy Move.—The Cincinnati Street Railway Cincinnati, Ohio, has abandoned its Glendale to Hamilton, Ohio, line, which it recently acquired, together with the Zoo-Glendale route from the Cincinnati & Hamilton Traction Company. For years the line had been operated at a loss and authority to abandon it was given by the Ohio Public Utilities Commission. The railway will continue to operate the Zoo-Glendale route as a part of the original Cincinnati & Hamilton Traction system.

West Penn Railways Calls Debentures.—The West Penn Railways, Pittsburgh, Pa., will redeem on Sept. 1 the entire \$3,500,000 principal amount of the three-year 6½ per cent gold debentures.

Asks Street Railway Foreclosure.—Foreclosure of a mortgage protecting a bond issue of \$180,000 by the Milford & Uxbridge Street Railway, Milford, Mass., is sought by a bill in equity brought in the Supreme Court at Boston by the American Trust Company, Boston. The bank also asked for a receiver. The principal of the mortgage, issued in 1898, was payable on Jan. 1, 1923.

Toledo Line Abandoned.—The City Council of Toledo, has approved abandonment of the Indiana Avenue line of the Community Traction Company, Toledo, Ohio, in order to prepare for repaving of the streets and removal of tracks. Company officials have contended for more than five years that the line was unnecessary and a burden.

Successor to Westchester Company Chartered.—The Westchester Street Transportation Company, Inc., has been chartered at Albany with capital of \$180,000 in \$100 shares, with duration of 1,000 years to operate a street surface railroad in Westchester County. Alfred T. Davidson, 2396 Third Avenue, New York City, is attorney for the corporation. It will be recalled that it was Mr. Davidson who purchased for the Third Avenue Railroad the Westchester Street Railroad, sold under foreclosure recently. Presumably the new company is the successor under foreclosure to the Westchester Street Railroad.

Certificate of Dissolution Filed.—A certificate has been filed in the office of the Secretary of State at Albany, N. Y., dissolving the corporate existence of the Nassau County Railway, Sea Cliff, L. I., which suspended operation of its 10-mile line some months ago.

Massachusetts Line Reports Surplus.—Eastern Massachusetts Street Railway, Boston, Mass., reports June gross of \$740,924, against \$744,423 in June, 1925. June surplus after taxes and charges was \$46,313, comparing with \$36,823 for the similar month of the previous year.

Milwaukee Electric Calls Bonds.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has announced that it will redeem and pay on Sept. 1 at the office of the Central Union Trust Company in Milwaukee, all refunding and first mortgage 6 per cent gold bonds outstanding under this mortgage, series C. The bonds will be redeemed at 104½ and accrued interest.

Legal Notes

FEDERAL SUPREME COURT—*Private Carrier Cannot Be Converted Against His Will Into a Common Carrier by Legislative Demand.*

This decision declares unconstitutional the auto-stage and truck transportation act of California as applied to the Frost & Frost Trucking Company, in which the California Railroad Commission attempted to class this company as a common carrier, although it claimed to be purely a private carrier. The Federal Supreme Court did not question the power of the state to prohibit the use of public highways in proper cases, but it did question the right of the state to permit the use of the highways only on conditions which required the relinquishment by the grantee of his constitutional rights. The majority of the opinion also says that it did not challenge the power of the state or of the railroad commission under the present statute, whenever it shall appear that a carrier, posing as a private carrier, is in reality a common carrier. Dissenting opinions were held by three justices. [Frost vs. Railroad Commission, 42 Supreme Court Rep., 605.]

COLORADO—*Power of Utilities Commission Over Common Carriers Defined.*

When a business is affected with a public interest, as is that of the common carrier, the right of the public to regulate it is unquestioned. When a common carrier seeks to utilize public property such as streets and highways, the authority of the public becomes twofold. Motor common carriers attempting to operate without a certificate of convenience and necessity can be stopped by injunction. [Greeley Transportation Co. vs. People, 245 Pacific Rep., 720.]

INDIANA—*Surrender of Franchise for Indeterminate Permit Voids Former Franchise Conditions.*

In 1922 a railway surrendered its franchise in a city and took out an indeterminate permit, pursuant to the provisions of an act of the General Assembly. Subsequently, it secured permission from the city to operate freight cars over its tracks, a service which was forbidden by the former franchise. The right to do so was upheld in a case brought for damages by a number of property owners, the court holding that with the indeterminate permit such freight operation does not constitute an additional servitude on the property. [Chicago, L. S. & S. B. Railway, vs. Guilfoyle et al, 152 Northeast. Rep., 167.]

MARYLAND—*Collision at Street Intersection of Railway Built on Reservation*

Where a railway in the suburbs is built in a reservation except where it crosses intersecting streets, its rate of speed is usually much higher than allowed on a street. Hence, more caution

is expected of those crossing the railway track at such street intersections. The obligation to exercise ordinary care is not fulfilled by looking once, but by continuing to look until all danger of a collision is past. [Crystal et al. vs. Baltimore & B. A. Elec. Ry., 132 Atlantic Rep., 629.]

MICHIGAN—*Duty of Prudent Man at Street Intersection*

"A reasonably prudent man will not take a chance of street cars slowing up to let him cross a street." [Public Administrator of State of Michigan vs. City of Detroit, 207 Northwest. Rep., 882.]

MISSOURI—*Definition of "Vigilant Watch"*

Under the "Vigilant Watch" ordinance in St. Louis, a motorman must keep, not ordinary, but vigilant watch for persons and vehicles approaching or crossing the tracks. This duty is broader and stronger than the usual common-law duty of ordinary care, except in situations where common law would impose a very high degree of care, as in highly congested places of travel. Under this law, however, vehicle drivers and pedestrians are required to exercise only ordinary care to protect themselves. [Grossman vs. Wells, 282 Southwest. Rep. 710.]

NEBRASKA—*Ordinance Regulating Auto Buses Held Not to Be a Franchise but Regulatory and Therefore Valid*

The city of Omaha passed an ordinance authorizing the issue of permits for auto buses, provided they fulfill certain provisions. This ordinance was attacked by the plaintiff on the ground that the city did not have power under its charter to grant "franchises." The Nebraska Supreme Court held, however, that the permits contemplated were not "franchises," a number of definitions of franchises being given. Instead the permits were in the direction of regulating the use of the streets. The ordinance, therefore, was within the power of the city to pass under its charter. [O. & C. B. Street Railway vs. City of Omaha, 208 Northwest. Rep., 123.]

NEW JERSEY—*Care Required in Stairway Maintenance in Railroad Stations*

An instruction that a passenger, who was injured by falling on the steps of a railway station, was entitled to have the stairway "in good condition for her to be carried on it" was held erroneous, because it made the railway an insurer and imposed a greater burden on it than was justified by law. The railway need only exercise reasonable care to provide a safe place for passengers going to and from the trains. [Pabst et al. vs. The Hudson & M. R. Co., 133 Atlantic Rep. 74.]

NEW HAMPSHIRE—*Liability in Collision at Railroad Grade Crossing*

A state statute requires drivers of street railway cars, before crossing steam railroad tracks, to stop their cars before crossing and to examine carefully for approaching trains. Where a street car operator, depending upon the fact that the gates were open, crossed the track and was struck by a train hidden behind a line of standing cars, he was held contributorily negligent, barring recovery. [Carleton vs. B. & M. R.R., 132 Atlantic Rep., 680.]

NEW YORK—*Examination of Railway Official in Negligence Case*

Under civil practice act, Sec. 289, the vice-president and general manager of a railroad is subject to examination by the plaintiff in a negligence case respecting the operation, maintenance, equipment and management practice of the railroad. But the court should be careful, especially in such a case, to limit the inquiries to matters clearly necessary and material, such as the facts and circumstances of the accident itself, the equipment, weight and condition of the railway car, the time schedule and the operating rules and regulations having reference to the occasion in question. Expert opinions and experimental tests do not fall within the scope of permissive examination. The railroad's claim agent is not a person subject to examination concerning operation, maintenance, equipment and management of the railroad under the act. [Warner vs. Rochester & S. R. Co., 214 N. Y. Sup., 579.]

TEXAS—*Duties to Alighting Passenger.*

A passenger signaled for a car to stop and thinking it was about to do so attempted to alight and was injured. The company was held not responsible, the court holding: "It is only at such places where it may be reasonably anticipated that a passenger may attempt to leave the car that the duty rests on the carrier to use care in allowing time for passengers to alight therefrom." [Galveston Elec. Co. vs. Marangola, 283 Southwest. Rep., 777.]

VIRGINIA—*Duty to Person Who Gives Signal to Board Car When Not at a Regular Stopping Point*

A person standing at a corner where she knew cars did not usually receive passengers signaled an approaching car, thinking it might stop, then crossed in front of the car to get on the side on which the entrance was. The car did not stop and she was struck by the rear of the car as it swung around the curve. The company was held not to be negligent as a matter of law. [Beale vs. Virginia R. & P. Co., 131 Southeast. Rep., 200.]

WASHINGTON—*Motorman May Assume Automobile Will Change Course to Avoid Collision.*

Where an automobile and a street car approach head on, the motorman may assume that the automobile will change its course to avoid a collision, where it has time and opportunity to do so. [McKinney et al. vs. City of Seattle, 245 Pacific Rep., 913.]

Personal Items

Superintendent of Galveston-Houston Interurban Named

James W. Howard has taken over the position of superintendent of the Galveston-Houston Electric Railway, Galveston, Tex. He succeeds C. A. Brann in this position.

Mr. Howard is a graduate in mechanical engineering, class of 1921, Stevens Institute of Technology, Hoboken, N. J. After his graduation he worked for three months in the home office of Stone & Webster, Inc., at Boston. Following this he was transferred to the Fall River Gas Works Company at Fall River, Mass., where he remained for six months. He was then transferred to the Blackstone Valley Gas & Electric Company at Pawtucket, R. I., where he stayed for 3½ years as the company's engineer of industrial service. Following this connection Mr. Howard went to Houston as superintendent of the Galveston-Houston Interurban, another utility property under Stone & Webster direction. He is a native of Brooklyn, N. Y.

George W. Burgess with Houston Electric Company

George W. Burgess recently was transferred from the Boston office of Stone & Webster, Inc., to the Houston Electric Company, Houston, Tex. Mr. Burgess is connected with the traffic department of the Houston Electric Company. He is a native of Milton, Mass., and received his A.B. degree at Harvard University in 1925. In September, 1925, he joined the Stone & Webster organization at its office in Boston.

Charles Jones Made General Manager of South Shore

The appointment of Charles Jones, former electrical engineer of the Chicago Rapid Transit Company and Chicago, North Shore & Milwaukee Railroad, as general manager of the Chicago, South Shore & South Bend Railroad and the removal of the company's operating headquarters from Gary to Michigan City, Ind., have been announced by Charles W. Chase, vice-president and former general manager of the South Shore Lines. Mr. Jones has spent twenty years in various electric railway executive positions. He will succeed Mr. Chase as general manager.

The operating department of the railroad was established in Gary following the purchase of the insolvent Lake Shore system by the Insull interests a year ago. The executive offices and accounting department will remain in Gary, but the entire operating force, including the electric, maintenance and purchasing departments, will be transferred to Michigan City at once.

Thomas W. Hamilton, assistant general manager; J. K. Gray, general

superintendent, and their assistants, will continue in these capacities, but will likewise be assigned to the new headquarters.

The re-electrification program was completed on July 28. The company's new steel passenger cars are now being operated over the entire line from South Bend to Kensington.

L. E. Lippitt in Charge of Central New York Road

Laurence E. Lippitt, newly-appointed manager of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., is a veteran in experience in electric railroading, and virtually has climbed from the bottom of the ladder to the top in the score of years he has been in the industry.

He is only 37 years old, one of the



Laurence E. Lippitt

youngest of electric railway executives in central New York state. He began his career as an employee of the Oneida Construction Company, which electrified the West Shore Railroad between Syracuse and Utica, a line now operated by the New York State Railways. This was in 1906.

In September, 1907, he entered the employ of the New York State Railways and served in various positions in the accounting department.

In July, 1913, he was appointed auditor of the Syracuse & Suburban Railroad, under the management of Allen & Peck, Inc.

Three years later he became auditor-treasurer of the Auburn & Syracuse Electric Railroad under the management of Peck, Shanahan & Cherry, Inc.

He held this position until July 1, 1926, when he was named general manager of the company to succeed W. J. Harvie, resigned.

The Auburn & Syracuse operates between Syracuse and Auburn and also the lines in Auburn and to Owasco Lake, where it controls Lakeside Park.

D. P. Morrison has been appointed general manager of the Dundee Corporation Tramways, Dundee, Scotland, to succeed W. T. Young. Mr. Morrison has hitherto been engineer and deputy-manager to the Gateshead & District Tramways, while Mr. Young has gone to be general manager of the Halifax Corporation Tramways.

Thomas J. Brennan, whose resignation as general manager of the Dayton, Covington & Piqua Traction Company, West Milton, Ohio, was reported in the May 1 issue of the ELECTRIC RAILWAY JOURNAL, announces that he has reconsidered his intention to sever his connection with that company and decided to remain at his old post of general manager. Mr. Brennan has served the Dayton company for more than twenty years.

Obituary

J. W. McCrosky

J. W. McCrosky, for many years in charge of electrical construction work in this country and South America for the J. G. White Company, New York, is dead at Pasadena, Cal., at the age of 57.

Mr. McCrosky was a Nebraskan and one of the first electrical engineers graduated at the University of Nebraska, where he studied under Mr. White, then a professor at the university. His first work was the electrification of the Lincoln railway system. Mr. White sent him to South America first, and later he looked after the English end of the business. Many street railways and other electric utilities were built under his supervision in different parts of the world. He served the government during the war as an expert at Washington, and following that was in charge of the foreign trade department of the Bankers Trust Company, New York. He retired from business some time ago.

F. S. Terry

Franklin S. Terry, Cleveland, Ohio, vice-president of the General Electric Company and for years a leader in the incandescent lamp business, died suddenly, of heart failure, at his summer home at Black Mountain, near Asheville, N. C., on July 23. Mr. Terry was born in Ansonia, Conn., in 1862 and held his first position with the Electrical Supply Company of Ansonia. In 1889 he organized the Incandescent Lamp Company, Chicago, and four years later took personal charge of the company.

In 1901 the National Lamp Company, of which Mr. Terry was a founder, purchased the Sunbeam Company. A few years later the National Lamp Company merged with the General Electric, Mr. Terry remaining with the National Lamp Works, Nela Park, Cleveland, Ohio. He was one of the organizers of the National Electric Light Association. Mr. Terry devoted his genius as an organizer to the betterment of the manufacture and quality of incandescent lamps.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

More Cars for Cleveland Exhibit

Applications for space at the convention in Cleveland, Ohio, Oct 4, for the exhibit of street railway cars in special Section D, allotted to them, continue to be received by the American Electric Railway Association. The list of car exhibitors follows:

Beaver Valley Traction Company.
J. G. Brill Company.
Cummings Car & Coach Company.
Differential Steel Car Company.
Northern Ohio Power & Light Company.
Phoenix Ice Machine Company (Northern Ohio Refrigerator Car).
Pittsburgh Railways.
St. Louis Car.
Perley A. Thomas Car Works.
United Railways & Electric Company, Baltimore.

In addition the following companies have applied for track space on which to show operating maintenance of way equipment:

Blacker Engineering Company, Inc.
Electric Railway Improvement Company.
Ingersoll-Rand Company.
Metal & Thermit Corporation.
Railway Track-Work Company.

The sub-committee of the exhibit committee on decorations, L. W. Shugg chairman, will hold a meeting during the week ending Aug. 14, at which time contracts will be let covering decorations for both floors of the public auditorium and the auditorium's west wing.

The total list of exhibitors who have been assigned space to date numbers 208. The total square footage assigned amounts to 113,526. The total lineal feet of track space to be occupied by both car exhibitors and exhibitors of operating maintenance of way apparatus is 1,030 lineal feet.

An account of the proceedings of the meetings of the executive committee, including Fred Dell's report, is published elsewhere in the JOURNAL.

Midsummer Business Conditions Appear Unusually Prosperous

Business since 1923 has been, on the whole, better than for any other three-year period, except during the war, and there is no reason to expect serious depression in the near future. This is the substance of a review of national economic conditions given out by President Coolidge on Aug. 3.

Production in general is well above normal, particularly in the steel industry, which has been setting records for July. Consumption, however, is keeping up the pace, and prices remain practically unchanged.

The railroads show unusual activity. In June 4,112,150 cars were loaded, compared with 3,965,872 cars a year ago. This, of course, is an indication of the high level of general trade activity. Recent purchases of rails and inquiries for freight cars by the railroads testify to their activity.

Labor conditions are good. Wages

remain high, but commodity prices have dropped in the last few years. Thus there is not much dissatisfaction among the workers.

It is true that the textile industry continues in the doldrums, but none of the usual premonitory symptoms of depression are visible, and there is nothing to indicate any drastic decline in the general activity so prevalent at present.

Light-Weight Interurban Cars Now Operated by Gary Railway



Five new light-weight double-truck interurban cars built by the Cummings Car & Coach Company of Paris, Ill., have just been placed in service by the Gary Railways, Gary, Ind. The cars are now in operation on the Gary-Hobart and Gary-Indiana Harbor divisions. The company expects materially to reduce power requirements and running time through the use of these new cars, which were built at a cost of \$16,800 each. The new units weigh only 37,000 lb. and will replace cars of approximately 50,000 lb. in weight. Each car is equipped with all modern safety devices and seats 46 passengers. Some of the outstanding features of their construction are mahogany finished interiors, green plush upholstery, battleship gray linoleum floor covering, low entrance steps, safety windows and dome ceiling lights. Specifications follow:

Date order was placed.....March, 1926
Date of delivery.....July, 1926
Type of car.....Light-weight, double-end,
one-man, two-man interurban
Seating capacity.....46
Weight:
Car body.....17,600 lb.
Trucks.....11,000 lb.
Equipment.....8,400 lb.
Total.....37,000 lb.
Bolster centers, length.....21 ft. 0 in.
Length over all.....44 ft. 8 1/2 in.

Largest Electric Locomotive Is Sesqui-Centennial Exhibit

The largest and most powerful electric locomotive in the world has just been installed for exhibition at the Sesqui-Centennial Exposition in Philadelphia. Built by the General Electric Company for the Chicago, Milwaukee & St. Paul Railway to haul its "Olympian" and other transcontinental trains through the Rocky and the Cascade Mountains, the giant locomotive left Tacoma, Wash., a month ago on a journey of 3,000 miles to reach Philadelphia. Because of its immense size it was necessary to make several detours to reach Philadelphia, as movement under bridges and through tunnels on the direct route was impossible in several instances.

Truck wheelbase.....5 ft. 4 in.
Width over all.....8 ft. 8 1/2 in.
Height, rail to roof.....10 ft. 9 1/2 in.
Body.....All steel
Interior trim.....Mahogany
Headlining.....Agasote
Roof.....Arch
Air brakes.....General Electric
Armature bearings.....Sleeve
Axles.....Forged steel 4 in.
Bumpers.....Channel
Car signal system.....Faraday high voltage
Car trimmings.....Statuary bronze
Center and side bearings.....Cummings Car & Coach
Compressor.....CP-27B, 15 ft.
Control.....Double-end K-35 with line breaker
Curtain fixtures.....National Lock Washer
Curtain material.....Pantasote double coated
Destination signs.....Cummings Car & Coach
Door-operating mechanism.....National
Pneumatic
Fenders.....Steel pilots
Gears and pinions.....General Electric
Hand brakes.....Drop type
Heater equipment.....Railway Utility
Headlights.....Golden Glow
Journal bearings.....3 1/2 in. x 7 in.
Journal boxes.....Cummings Car & Coach
Lightning arresters.....General Electric
Motors.....Four GE-265, 35-hp., inside hung
Paint.....Detroit Graphite Company
Registers.....Ohmer
Sanders.....Ohio Brass
Sash fixtures.....O. M. Edwards
Seats.....Hale & Kilburn reversible
Seating material.....Plush
Step treads.....Feralun
Trolley catchers.....Ohio Brass
Trolley base.....General Electric
Trolley wheels.....General Electric
Trucks.....Cummings Car & Coach, MC-62
Ventilators.....Nichols-Lintern
Wheels.....Davis steel, 26 in.

Reduction of Physical Hazards in Industry Planned

Plans looking toward an intensive study of physical hazards in industry, with a view to conclusions which will bring remedies and remove the causes of accidents, were discussed in Washington, July 14, 15 and 16, at the Industrial Accident Prevention Conference called by Secretary of Labor Davis.

Resolutions were adopted at the closing session favoring a plan of detailed industries accident reports to some department of each state, these in turn to be forwarded to the United States Department of Labor. A bill to create in the bureau of labor statistics a division of safety, to gather and study accident statistics, met with considerable favor before Congress.

Speakers at the conference stressed the need of more adequate statistics in order more accurately to judge the cause of accidents in industry, which Secretary Davis estimated are costing 23,000 lives and 2,500,000 injuries annually. Frank Morrison, secretary of the American Federation of Labor, using Secretary Davis' further estimate that 85 per cent of industrial accidents are preventable, said that 19,550 are killed needlessly and 2,125,000 injured needlessly each year. He estimated the annual wage loss due to accidents at a billion dollars.

Seattle Bids Are In

Bids for supplying 80 new street cars for the Seattle Municipal Street Railway, Seattle, Wash., were opened on July 29 by the Board of Public Works. No action has been taken on the bids as yet as there seem to be a few technical details which must be straightened out before the contract is let. The following bids were received: St. Louis Car Company, \$17,500 each; Cummings Car & Coach Company, \$20,675; J. G. Brill Company, \$19,969. It is estimated that \$1,875,000 will be required to cover the total cost of these new units. They are to be double-truck cars, with a seating capacity of 58, and are to be used in city operation.

General Electric Board Pays Tribute to C. A. Coffin

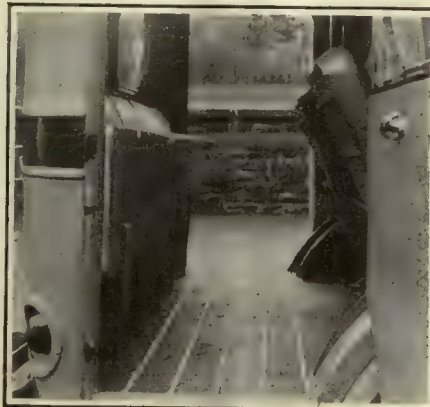
Resolutions expressing deep sorrow over the death of Charles Albert Coffin, founder of the General Electric Company, have just been adopted by the board of directors of that organization, meeting for the first time since his death on July 14. The resolutions are as follows:

"Charles A. Coffin was the founder of the General Electric Company, and throughout his life its leader. His spirit was its inspiration. He had unfaltering courage in trying times. He had modesty and self-restraint in the days of great success. He developed an art and built an industry so that his company might succeed and his country prosper. No man could do this without force and tact and sympathy. No man could do it without the capacity to select and the personality to stimulate other men. No man could do it without that modesty in his own achievements which repre-

sents the highest generosity to his associates. Truly, if an organization may be a monument to a man, then this company is a monument to him. Some of the members of this board have been associated with Mr. Coffin throughout the life of the organization, and others are indebted to him for their opportunity. For themselves and for every member of the organization, in whatever capacity, they record their gratitude, their appreciation of his service and their sorrow."

Extreme Lightness and Flexibility of Service Mark New Bus Body

Several unusual features mark the bus body recently developed by the Six-Wheel Company of Philadelphia and now being manufactured by the Alex Wolfington Company. Particularly in the matter of weight this body is inter-



Unusual Rear Entrance, Showing Taxi-Type Folding Seats

esting in its possibilities. Realizing that the proper place to obtain information regarding extreme lightness with the maximum of strength was the aircraft industry, the builders made a close study of general procedure in this field, and the body as finally evolved followed closely along airplane construction lines. The pillars themselves are copies of hollow airplane struts and the belt and head rails are modeled after the thick single wings of monoplanes. By combining these two types vertical and horizontal strength were obtained with extreme lightness.

The body subframe has been entirely eliminated, the pillars resting directly on steel channels. The side paneling is 14 gage aluminum, the body being ar-

ranged for servicing any section so that in case of collision a section can be removed and another installed.

Another outstanding feature of the body is that it is available for either city type or parlor car type of service. This is accomplished by having the center headroom 76½ in. high. By the removal of the curtains and present windows, the installation of raise type brass sash windows and outside window guards and handrails inside, over the aisle, the body becomes available for street car type service.

It will be seen from the accompanying exterior view of the body that a full headroom jack-knife street car type door has been built into the parlor car model. Two rear doors are in the body and folding taxi-type seats are available if desired, with baggage carrying space in the rear. All doors are connected with a red bullseye tell-tale light on the dash. Doors must be entirely closed before this light goes out.

The seating capacity of the body is 29 passengers, all facing forward, and the over-all length, bumper to bumper, is 27 ft. 11½ in. The body shell without seats weighs 2,702 lb. Complete with seats and ready for road service it weighs 3,518 lb. It is expected that within a few months, due to possible savings in weight of seats and hardware, it will be possible to reduce the combined weight of body and seats to approximately 3,000 lb., this being nearly 2,000 lb. less than ordinary construction.

John F. Ohmer Sizes Up the European Situation

That America has a hard battle before her if she expects to retain her present industrial supremacy was the substance of a statement recently made by John F. Ohmer, president of the Ohmer Register Company, upon his return from a three months' tour of Europe. Mr. Ohmer visited Italy, Switzerland, France and England, and was particularly impressed by the long strides which have been taken in Italy toward regaining pre-war economic prosperity. He also emphasized the fact that the English pound sterling being at a slight premium over the United States dollar shows the imposing financial stability of Great Britain. In spite of these facts, however, Mr. Ohmer believes that, with sane legislation and large scale production, the United States will continue to hold her commanding position in the commerce of the world.



Combination City and Parlor Car with Aluminum Body

Bridgeport Brass Ads Take First Place in Competition

A selection of the historical advertisements by the Bridgeport Brass Company, Bridgeport, Conn., similar to the ones which have appeared currently in *ELECTRIC RAILWAY JOURNAL*, received first prize for "the best use of art in industrial advertising" at the annual convention of the National Industrial Advertisers Association, held June 21 to 25 in Philadelphia. The three types of selling appeals which the Bridgeport company entered were a series of their Phono-Electric advertisements, a similar series on brass products and a third on plumbing fixtures.

Rolling Stock

Los Angeles Railway, Los Angeles, Cal., has placed an order for three more single-deck, 29-passenger buses. One of these is a six-cylinder gas-electric bus to be built by the Yellow Truck & Coach Manufacturing Company, equipped with air brakes, and the other two are six-cylinder Fageol buses.

Lincoln Traction Company, Lincoln, Neb., is double-ending its Birney cars in order to permit of the elimination of loops and wyes and the lessening of track maintenance costs thereby. Reversible seats with full leather upholstery and floors covered with linoleum will represent the company's efforts to make car interiors more inviting.

Track and Line

Winnipeg Electric Company, Winnipeg, Man., has completed plans and placed orders for material for the construction of double track on Osborne Street extension and Memorial Boulevard from Broadway to Portage. This work, it is expected, will be completed by Oct. 1. Special construction is necessary in connection with this work. A new grand union will be installed at Broadway and Osborne and a double wye at Portage and Memorial Boulevard. The tracks will be laid on concrete foundation with asphalt pavement and will be insulated with elastite rail filler, which eliminates the use of stone liners and reduces track noises. The city proposes to carry out a scheme of ornamental lighting standards which will at the same time be suitable for supporting the overhead trolley wires, thus eliminating the use of special poles for trolley wiring.

Wisconsin Gas & Electric Company, Kenosha, Wis., has applied to the Common Council for permission to lay a single track on Center Street to extend from Sixth Street to Washington Avenue. If the company's request is granted this new line will speed up railway service during rush hours in the downtown district, as cars from the north will then be permitted to be returned to that section without traveling to the west limits of the city.

Williamsport Passenger Railway, Williamsport, Pa., has submitted to the Council plans for the new trackage and

street improvements. The company desires additional franchises as a result of rerouting and the relocation of the carhouse. The company also asks to install new switches and rebuild and replace track on Basin, Fourth, East Fourth, Washington, West Fourth and Beeber Streets.

Lincoln Traction Company, Lincoln, Neb., with the permission of the City Council, will substitute a single track for a double track on a part of its line that serves the state fair.

Los Angeles Railway, Los Angeles, Cal., has received a consignment of 825 tons of 116-lb. steel girder rail, part of the 2,000 tons ordered from the Bethlehem Steel Company. The rail will be used in the extensive track reconstruction program on which the railway is now engaged. At present there are four large jobs under way. The old 60-lb. rail on the West Adams line is being replaced with 116-lb. grooved girder rail.

Trade Notes

Triumph Electric Corporation, Cincinnati, Ohio, has been organized to take over the good will, designs, records, patent rights and inventions of the Triumph Electric Company. So far as practical the new company will retain the old personnel and Triumph customers are promised prompt service on existing installations and the same high quality in new product for which the old company was so well known. The new company will specialize on its TR self-start automatic heavy-duty motor and at the same time be in a position to supply its other lines of electrical and refrigeration products.

Charles W. Harris, San Francisco, has been selected to build up a sales organization for the Dunn Painting Machine Company of the same city. The sales division of the company will be located on the second floor of the Dettner Building, 335 Howard Street, San Francisco, Cal.

R. J. Tiedeken has been appointed raw material salesman in the Philadelphia territory of the Bridgeport Brass Company of Bridgeport, Conn. Mr. Tiedeken has had considerable experience in the manufacture and sale of brass goods, having been associated with several different firms in that field.

Metal, Coal and Material Prices

Metals.—New York		Aug. 3, 1926
Copper, electrolytic, cents per lb.	14.50	
Copper wire, cents per lb.	16.25	
Lead, cents per lb.	8.925	
Zinc, cents per lb.	7.75	
Tin, Straits, cents per lb.	65.00	
Bituminous Coal f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$4.675	
Somerset mine run, Boston, net tons	2.075	
Pittsburgh mine run, Pittsburgh, net tons	1.75	
Franklin, Ill., screenings, Chicago, net tons	1.825	
Central, Ill., screenings, Chicago, net tons	1.50	
Kansas screenings, Kansas City, net tons	2.50	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.25	
Weatherproof wire base, N. Y., cents per lb.	18.00	
Cement, Chicago net prices, without bags	2.10	
Linseed oil (5-bbl. lots), N. Y., cents per lb.	12.6	
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.50	
Turpentine (bbl. lots), N. Y., per gal.	\$0.95	

New Advertising Literature

Condit Electrical Manufacturing Corporation, Boston, Mass., asks in its most recent circular, "Do You Need a Chaperon?" It then completes the analogy by pointing out that Condit M-4 safety switches equipped with thermal cutouts provide complete safety in supervisory control for motors up to 5 hp. and 600 volts. Industrial Handbook 5007 provides information on these switches.

Hill, Hubbell & Company, San Francisco, Cal., have issued a booklet which comprises 77 questions and answers on Bitulumin and other aluminum paints and metal primers. The treatment of the information given is such that it will satisfy both the executive and the scientific expert, the answers having been couched in language as non-technical as possible, although containing accurate information on practically every phase of metal painting.

Roller-Smith Company, New York, N. Y., has issued bulletin No. 550, covering new type SR line of relays. These type SR relays supersede the old Imperial type relays and have many marked advantages over the old type. The scales are longer, the accuracy is much greater, the torque has been increased several times and the new 7½-in. round pattern style of case matches the type SA and type SD lines of indicating instruments. Complete technical details are given in the bulletin.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued special publication No. 1734, a 55-page discussion of regulators for generator-voltage control. Data contained in this pamphlet have not heretofore been published, in particular the sections on rheostatic type automatic voltage regulators and special regulator applications having just been released by the Westinghouse company.

General Electric Company, Schenectady, N. Y., has issued booklet GEA 441, entitled "Gas-Electric Drive for Buses." In this publication the various advantages of single motor and dual motor electric drives are discussed, and the features which all gas-electric equipment has in common are outlined. The subject is considered generally rather than individually in the matter of manufacturers of this type of vehicle.

American Brown Boveri Electric Corporation, New York, N. Y., has issued circular No. 400, which describes the newly developed electric locomotive with individual axle drive. The general advantages of this type of drive are given as well as a number of specific ways in which the Brown Boveri development has attacked the various problems.

J. G. Brill Company, Philadelphia, Pa., has issued the second reprint of a series of advertisements from *ELECTRIC RAILWAY JOURNAL* setting forth the advantages of modern cars.

Copperweld Steel Company, Rankin, Pa., has issued revised engineering data and wire tables on messenger, guy and span wire for insertion in the standard loose-leaf binder which it furnishes for all of its engineering data sheets.

Equip those modern cars with modern hand brakes

When specifying equipment for those modern cars, do as so many other leading railways have done—specify Peacock Staffless Brakes.

They have a demonstrated capacity for winding in 144 inches of chain—so that even though chains are slack and brake shoes worn, adequate braking is assured at all times. They are light in weight and occupy little platform space.

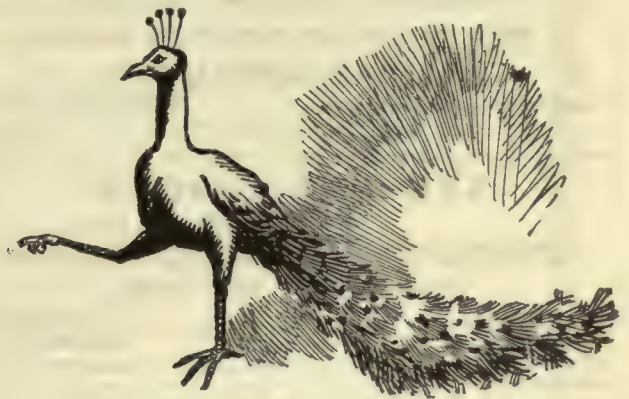
We will gladly send you facts and figures proving what these brakes have done for others and what they will do for you.

NATIONAL BRAKE CO., Inc.
890 Ellicott Sq., BUFFALO, N. Y.

Canadian Representatives:
Lyman, Tube & Supply Company, Limited, Montreal, Canada



Ask for
installation
estimates.



PEACOCK

Staffless Brakes

Bankers and Engineers

Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation

Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

43 Exchange Place

New York

STONE & WEBSTER

Incorporated

EXAMINATIONS REPORTS APPRAISALS
ON
INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

New York

Boston

Chicago

THE BEELER ORGANIZATION

ENGINEERS AND CONSULTANTS

Traction - Traffic - Equipment - Power Investigations

TRANSPORTATION, TRAFFIC, AND OPERATING SURVEYS

COORDINATING SERVICE—FINANCIAL REPORTS

APPRAISALS—MANAGEMENT

52 Vanderbilt Ave.

New York

SANDERSON & PORTER ENGINEERS

PUBLIC UTILITIES & INDUSTRIALS

Design Construction Management
Examinations Reports Valuations

CHICAGO

NEW YORK

SAN FRANCISCO

Byllesby Engineering & Management Corporation

231 S. La Salle Street, Chicago

New York

San Francisco

ALBERT S. RICHEY ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

ENGELHARDT W. HOLST

Consulting Engineer

Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management

683 Atlantic Ave., BOSTON, MASS.

Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

ARCHBOLD-BRADY CO.

Engineers and Contractors

SYRACUSE, N. Y.

DAY & ZIMMERMANN, INC. ENGINEERS

DESIGN - CONSTRUCTION - REPORTS

VALUATIONS - MANAGEMENT

NEW YORK

PHILADELPHIA

CHICAGO

STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING
CONSTRUCTION

YOUNGSTOWN, O.

FINANCING
MANAGEMENT

WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly and Sunday Pass—Differential
Fares—Ride Selling

143 Crary Ave., Mt. Vernon, N. Y.

HEMPHILL & WELLS

CONSULTING ENGINEERS

Gardner F. Wells

Albert W. Hemphill

APPRAISALS

INVESTIGATIONS COVERING

Reorganization Management Operation Construction

43 Cedar Street, New York City

KELKER, DELEUW & CO.

CONSULTING ENGINEERS

REPORTS ON

Operating Problems

Rates

Traffic Surveys

111 W. Washington Street, Chicago, Ill.

A. L. DRUM & COMPANY

Consulting and Constructing Engineers

VALUATION AND FINANCIAL REPORTS
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE
COMMISSIONS

CONSTRUCTION AND MANAGEMENT OF
ELECTRIC RAILWAYS

230 South Clark Street, Chicago, Ill.

MCCLELLAN & JUNKERSFELD

Incorporated

ENGINEERING AND CONSTRUCTION

Examinations—Reports—Valuations

Transportation Problems—Power Developments

68 Trinity Place, New York

CHICAGO

ST. LOUIS

C. B. BUCHANAN
PresidentW. H. PRICE, JR.
Sec'y-Treas.JOHN F. LAYNG
Vice-President**BUCHANAN & LAYNG CORPORATION**Engineering and Management, Construction,
Financial Reports, Traffic Surveys
and Equipment MaintenanceBALTIMORE
1904 Citizens National
Bank Bldg.Phone:
Hanover: 2142NEW YORK
49 Wall Street**THE P. EDWARD WISH SERVICE**50 Church St.
NEW YORKStreet Railway Inspection
DETECTIVES131 State St.
BOSTONWhen writing the advertiser for information or
prices, a mention of the Electric Railway
Journal would be appreciated.**Coin Counting and Sorting Machines****FARE BOXES**

Lever-Operated and Slip Change Carriers

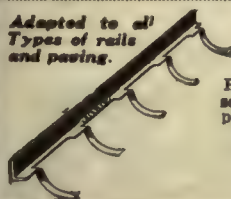
The Cleveland Fare Box Co.

Cleveland, Ohio

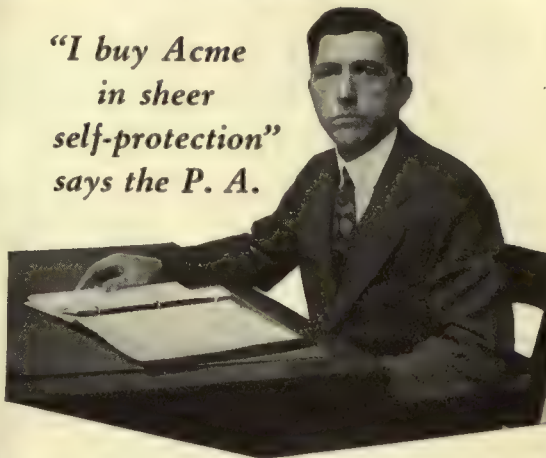
Canadian Cleveland Fare Box Co., Ltd., Preston, Ont.

A Single Segment or a Complete Commutatoris turned out with equal care in our shops. The orders we fill
differ only in magnitude; small orders command our utmost care
and skill just as do large orders. CAMERON quality applies to
every coil or segment that we can make, as well as to every
commutator we build. That's why so many electric railway men
rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut

*Gets Every Fare***PEREY TURNSTILES
or PASSIMETERS**Use them in your Prepayment Areas and
Street CarsPerey Manufacturing Co., Inc.
101 Park Avenue, New York City**UNA****RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING ROD****UNA Welding & Bonding Co.**
Cleveland, Ohio**Your Name**in this space in all issues where larger
display space is not used backs up your
advertising campaign and keeps your
name in the alphabetical index.**GODWIN****Steel Paving Guards**Proven by service to economically prevent
seepage and disintegration of street railway
paving.

Write for Illustrated Catalog No. 20

W. S. GODWIN CO., Inc.
Race and McComas St., Baltimore, Md.*"I buy Acme
in sheer
self-protection"
says the P. A.*I could save a little on magnet wire, but
with Acme we get better production, and
the shop doesn't complain of defects; so
I feel I'm "sound" in buying it, even on a
slightly higher quotation.**ACME MAGNET WIRE***Saves Time in the Shop*To the observer Acme Magnet Wire may
look about the same as four or five other
brands. But, to the people in the shop whose
job it is to work it into the finished product
it's another story. They notice very soon that**Acme Magnet Wire**

- is firmly spooled, making possible rapid,
accurate winding;
- runs smooth and uniform from end to end;

Acme Wire Enamel

- is applied in an even film;
- is extremely flexible under all sorts of
winding conditions;

Acme Cotton and Silk Coverings

- are wrapped firmly, closely, evenly and
continuously;
- will not open up on small diameter winding

There are many points about Acme Magnet Wire
which are cause for constant satisfaction after the
product is in service, but we mention here only the ones
that smooth the way of production in the shop. . . the
ones that justify the payment of a little more than the
lowest competitive price.The complete story of the tests Acme Magnet Wire
have to undergo is contained in our**Magnet Wire Specifications No. 3-J**Every Purchasing Agent should have this folder on
file, and should read it before filing. May we send
you yours now?**THE ACME WIRE CO.***Main Office and Plant, NEW HAVEN, CONN.*New York, 52 Vanderbilt Ave.
Boston, 80 Federal St.Chicago, 427 West Erie St.
Cleveland, Guardian Bldg.



Goodyear-equipped motorbus of Detroit Motorbus Company, on one of their regular routes

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.

MILEAGE

Tells the Story

Detroit Motorbus Company operates 357 buses in city, suburban and private hire services.

All of them are equipped with Goodyear Tires—242 of them on Goodyear Pneumatic Bus Tires.

Both the Company and our Detroit Branch keep a very accurate record of the tire performance of this fleet, the miles each tire runs, the tire cost per bus-mile and per passenger-mile.

These records show a uniformly high mileage for Goodyear Tires in this exacting service.

Among the exceptional mileages registered is the record of Goodyear Pneumatic Bus Tire No. 296, which gave 73,152.9 miles

—never punctured and never taken off its original position—on a rear wheel, where it got the worst of the load and the traction.

Others include No. 186, Goodyear Pneumatic Cord Bus Tire, which gave 58,495.6 miles of service; No. 528, 65,667.6 miles; No. 530, 51,075.1. Any number of them show on the cards from 40,000 to 50,000 miles.

Goodyear Tires, made with that extra-durable, extra-elastic fabric developed by Goodyear for Goodyear Pneumatic Tires—SUPERTWIST—provide the last word in active, tractive, secure and long-wearing service—low tire cost per mile. Only Goodyear Tires are made with SUPERTWIST—yet they cost you no more.

For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service

BUS TIRES

Made with SUPERTWIST



Transportation Accounting

An Ohmer Fare Register in an electric railway car or a motorbus records each sale of transportation more accurately, more quickly and more permanently than could an expert accountant stationed at a desk at the point where the sale is made.

The Ohmer Fare Register is a mechanical accountant which plainly indicates the amount and the class of the fare paid and records it in the form of a condensed detailed printed report which remains forever a permanent record of the day's business.

Ohmer Fare Registers are made in many types and sizes with capacities for recording any possible cash or ticket denomination and with operating equipments adapted to all types of cars and buses.

Ohmer Fare Register Company

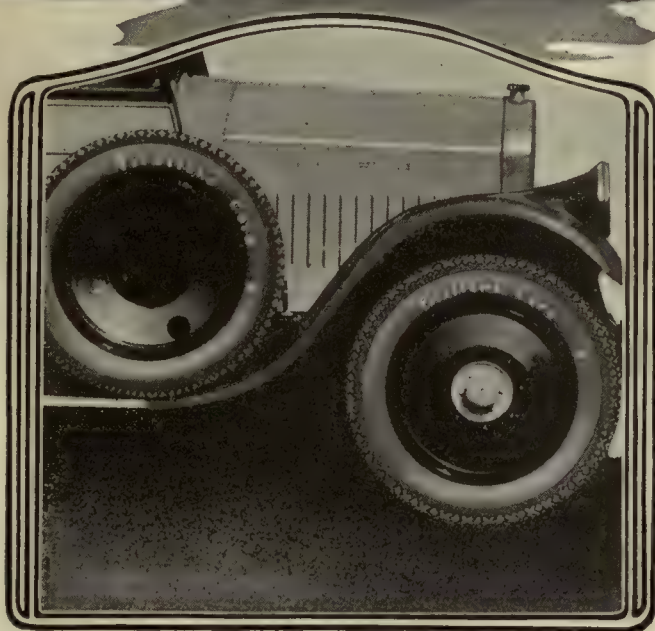
Dayton, Ohio, U. S. A.



OHMER
REG. U.S. PAT. OFF.
FARE REGISTERS



Part of the Firestone equipped
Pierce-Arrow Buses owned and operated by the
company quoted below



A Close View of the Tire Equipment

"Firestone Makes it Possible for us to Maintain Accurate Schedules"

"Having just completed an audit of our books for the 1925 fiscal year just ended, we feel very gratified to find that our tire mileage average has been slightly in excess of 24,000 miles per tire, which was far beyond

our expectations. I am doubly pleased with this performance, as it has occasioned no road delays to our coaches due to tire failures. We feel that only by this service, has it been possible for us to maintain accurate schedules with our fleet of coaches."

In Firestone Bus Pneumatics only are Gum-Dipped Cords used—the exclusive Firestone rubber-insulating process that adds greater strength to every cord and fiber—reducing costly internal friction and heat—increasing tire mileage and giving greater operating economy. Let the Firestone Bus Tire Engineers help your fleets maintain schedules at lowest cost per mile. See nearest Firestone dealer.

MOST MILES PER DOLLAR



Firestone

Gum-Dipped Bus Pneumatics

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER. . . *Harvey Firestone*

HASKELITE

HASKELITE

Haskelite, the structural plywood. Cemented with blood albumen glue, producing a waterproof and practically unbreakable bond.

Illinois Traction System Cars with Haskelite Roof, Floor and Truss Planks.



Car floors deserve increased attention

IN DESIGNING modern equipment, the floor of the car deserves more consideration than it has been given in many cases. It may be improved in appearance. We can't speak positively on that point. But we do know that it can be greatly reduced in weight with a corresponding reduction in cost of operation.

A typical car can show a saving in weight of 200 pounds by replacing the 13/16-inch fir sub-floor with 1/2-inch Haskelite panel. That one change saves \$12.00 a year in operating cost on every car, the equivalent of 170 free rides.

The Haskelite sub-floor can be furnished in large panels cut to size, making it simple and economical to install. Its strength is greater than fir and it retains its original strength through a long, useful life.

Haskelite is also being used by scores of progressive companies for roofs, headlining, sideling, seatbacks, and so forth; and Plymetl, the armored plywood, is rapidly becoming standard practice for side panels, dash, inside vestibule lining, and so forth. When these materials are properly applied, the total saving in weight can easily reach 935 pounds per car, or an annual operating economy of \$56 per car.

Are you utilizing these modern construction materials to the fullest extent? Blueprint booklets showing applications to car and bus construction will be sent on request.

HASKELITE MANUFACTURING CORPORATION

133 W. Washington Street, Chicago, Illinois

Canadian Representatives: Railway and Power Engineering Corp., Ltd.,
Toronto, Ont. and Montreal, Que.

PLYMETL

Plymetl, a plywood or pulp wood core with thin sheets of stretcher levelled steel glued to one or both faces. Maximum strength and minimum weight.

PLYMETL



A PORTION of one of the main assembly lines where steel, wood and expert craftsmanship are here wrought into form, making every complete unit a high standard of strength, appearance and comfort.

The AUTO BODY Co.

LANSING •

MICHIGAN

Designers and Manufacturers of Motor Coach and

Bus Bodies, Open and Enclosed Automobile Bodies

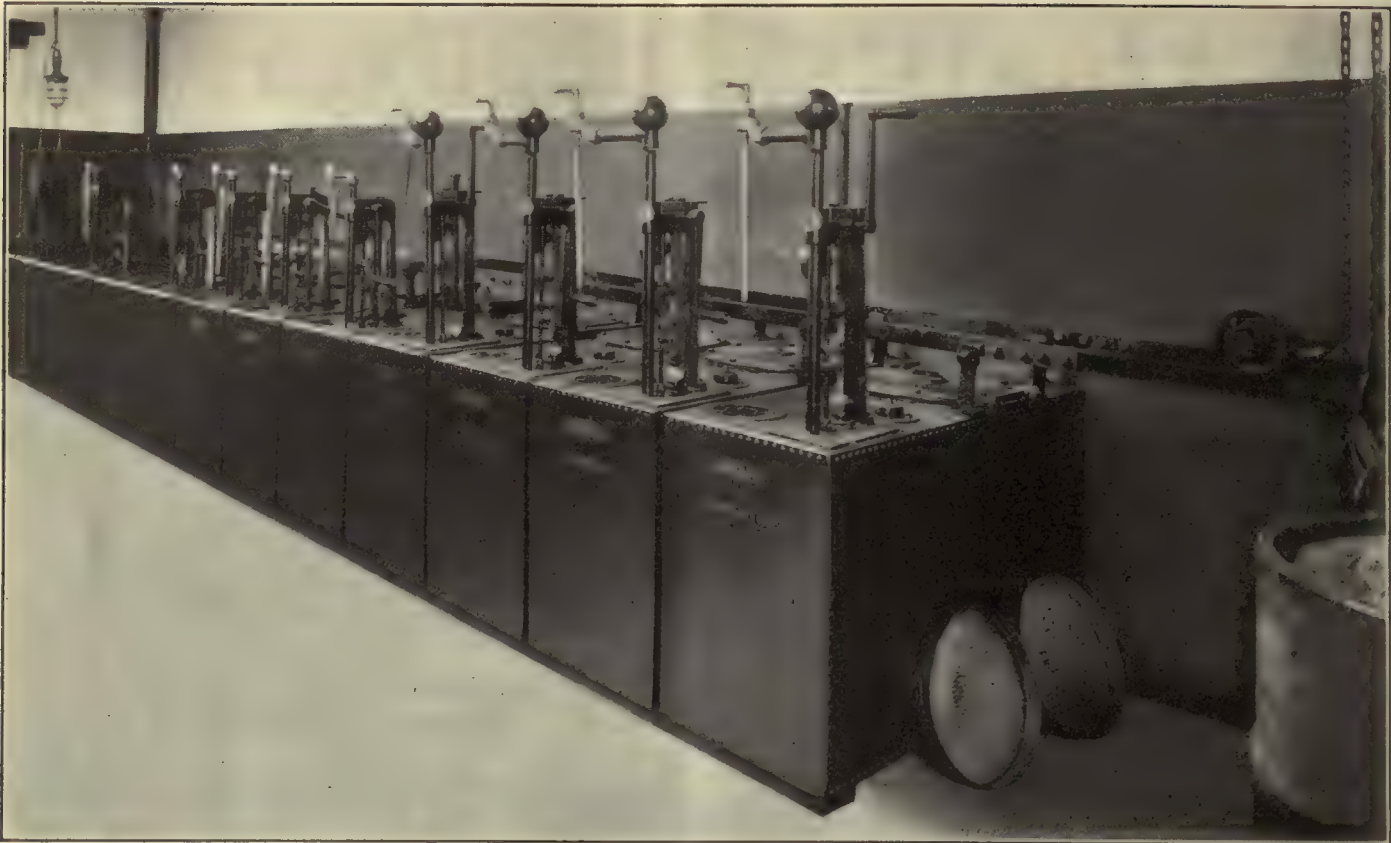
Gibraltar

Trademark Registered in United States and

Bodies ~

Canada. Applied for in foreign countries





Interior of George St. Terminal,
Charlestown—Boston Elevated
Railways.

Leaky Spigots Lose Dividends

Drum and barrel storage is vastly wasteful, whether it is paint oils or lubricants. Such losses come out of net earnings and dividends, and are absolute waste.



The Boston Elevated job, pictured here, was engineered by Bowser, after study of operating requirements.

Your needs can be similarly studied, analyzed and provided for, by men who have helped electric and steam railways to economy—and to better lubrication!

Give us a chance and we'll prove our case before a dollar is spent—address Dept. 51, please.

	<h1>S.F. BOWSER & COMPANY, Inc.</h1> <p><i>Pump and Tank Headquarters</i></p> <h2>FORT WAYNE, INDIANA.</h2>	
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A Quality Specification!

March 10, 1923

ELECTRIC RAILWAY JOURNAL

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Details of Philadelphia Order for 576 Cars

On Jan. 22 the board of directors of the Philadelphia Rapid Transit Company authorized the lease and purchase by car trust agreement of 576 cars of which 520 will be passenger cars. A brief note in regard to the order, which is said to be the single order for trolley cars in this country, was made in the issue of the ELECTRIC RAILWAY JOURNAL regarding the details regarding the order.

MANUFACTURERS OF EQUIPMENT. TOGETHER WITH TYPE FURNISHED

Air brakes G.E. Co.
Armature bearings Plain
Axles Carnegie Steel Co.'s heat treated
Bumpers Six-inch Channel reinforced
Car signal system Brill's standard and push
button contact bases—Faraday Type-E
Car trimmings
..... Malleable and bronze statuary finish
Center and side bearings Brill's standard
Conduits and junction boxes Galvanized
Control G.E. 2-K-68 with ratchet attachment
Couplers Drawbar pockets
Curtain fixtures Curtain Supply Co.'s No. 88
Curtain material Double face pantasote
Destination signs Hunter
Door operating mechanism
..... National Pneumatic Co.
Wheelguards H. B. Life Guard
Gears and pinions Tool Steel Gear & Pinion Co.
Headlights Consolidated Car Heating Co.'s
Heater equipment Crouse Hinds semaphore lens
bearings Plain
..... Plain cast-iron

1040

"Tool Steel" gears
and pinions

go on this new equipment.

A quality specification.

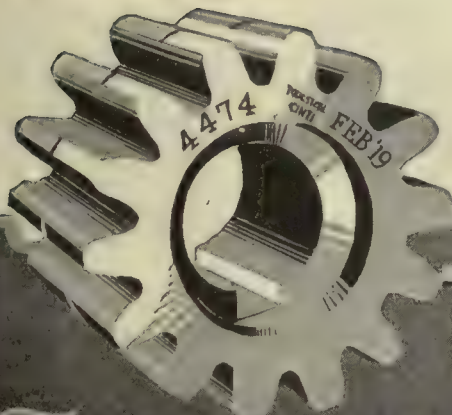
1923—1040 sets "Tool Steel"

1925— 200 sets "Tool Steel"

1926— 100 sets "Tool Steel"

Philadelphia believes in getting the best when they buy.

The Tool Steel Gear & Pinion Company
Cincinnati, Ohio



The Standard of Quality

TOOL-STEEL QUALITY GEARS AND PINIONS

"NATIONAL" TUBULAR STEEL POLES

Appearance—Plus Quality

THE tendency to improve the character of overhead construction by using Tubular Steel Poles is reflected in statistics prepared by the American Electric Railway Association. Figures compiled each year since 1916, for 25 of the larger electric railway companies indicate an increasing preference for the type of pole of maximum dependability. For electric traction construction ultimate economy has indisputable advantages over initial economy and these statistics show a fuller realization of this fact.

More consideration is being given today to Safety—Strength—Durability—Upkeep—Appearance—and General Dependability. Consequently, Traction Companies are finding it worth while to build with greater foresight; and when this principle guides in the selection, "NATIONAL" Tubular Steel Poles have usually been given preference.

In localities, as illustrated here, where civic dignity and beauty are in high esteem, "NATIONAL" Tubular Steel Poles are most satisfactory from every standpoint.

Ask for Bulletin No. 14—"NATIONAL"
Tubular Steel Poles

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

GENERAL SALES OFFICES: FRICK BUILDING

DISTRICT SALES OFFICES

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THIS De Luxe Coach on the Milwaukee-Racine-Kenosha interurban line of the Milwaukee Electric Railway & Light Company is equipped with "STANDARD" Rolled Steel Wheels.



Rolled Steel Wheels
Quenched and Tempered
Carbon Steel Axles
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STANDARD STEEL

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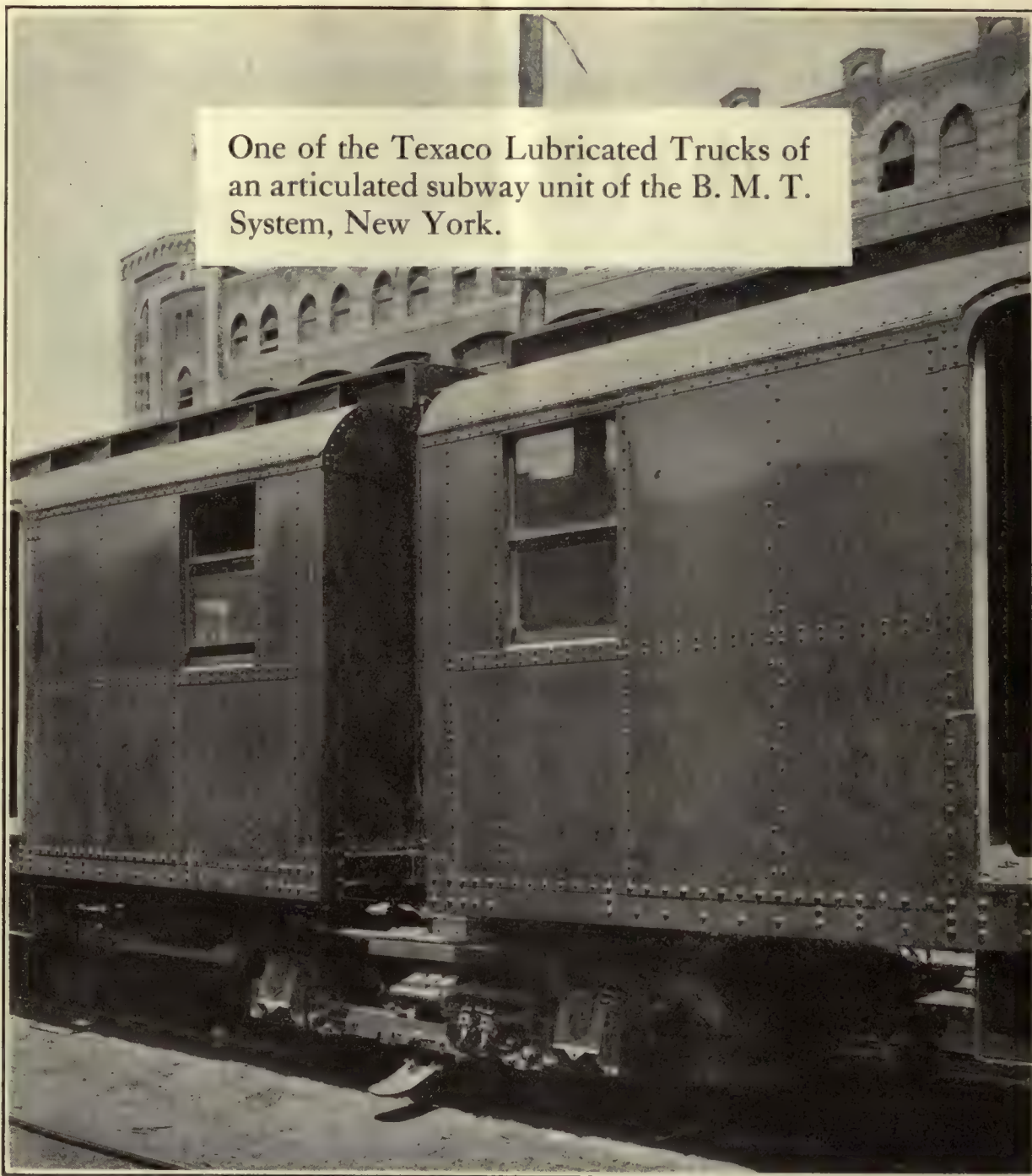
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One of the Texaco Lubricated Trucks of an articulated subway unit of the B. M. T. System, New York.



TEXACO



The Chosen Lubricant
of ELECTRIC RAILWAYS

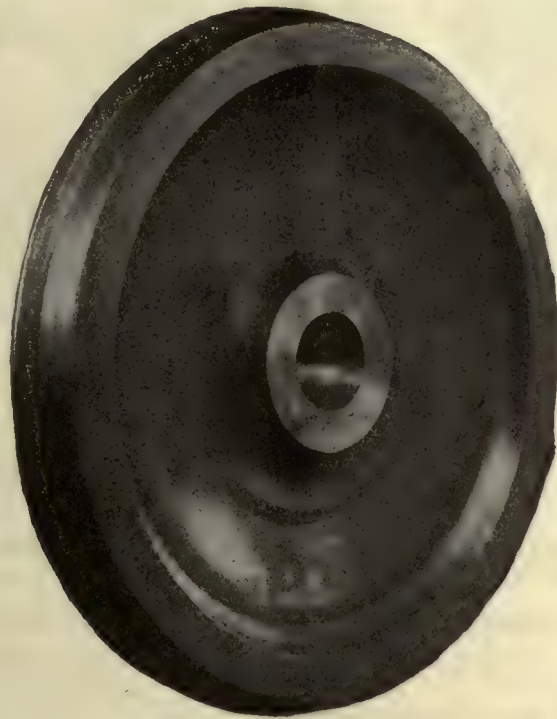


The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

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Wrought Steel

WHEELS



for minimum trouble
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for maximum mileage
for maximum safety

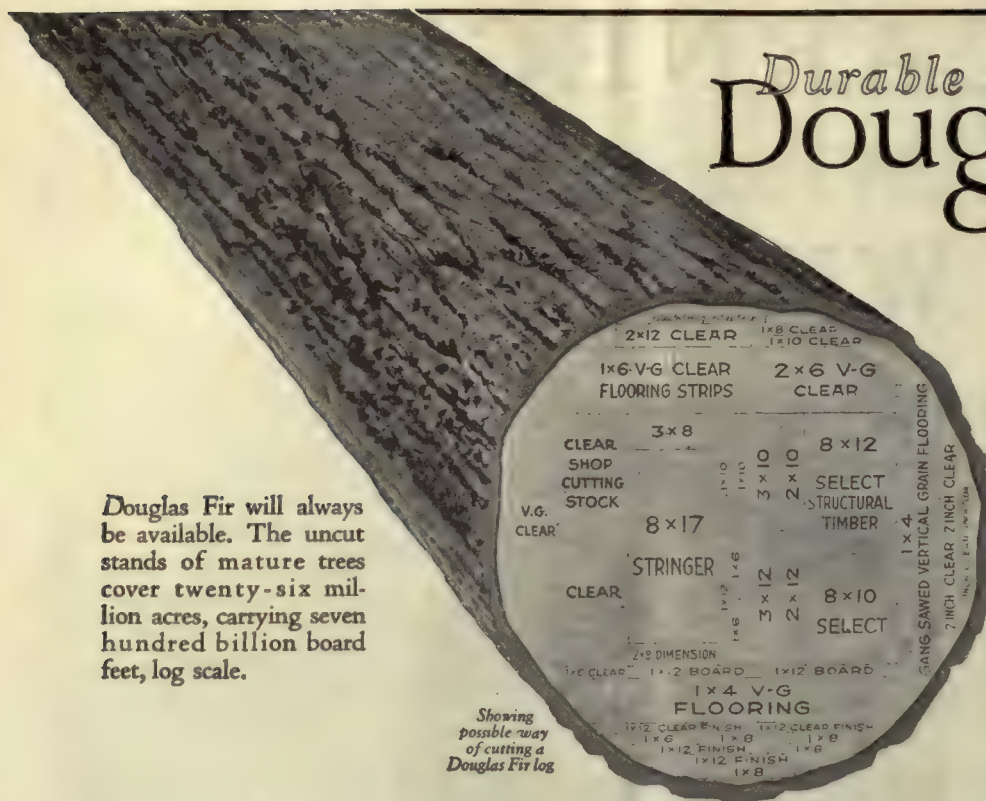
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PENNSYLVANIA



Douglas Fir will always be available. The uncut stands of mature trees cover twenty-six million acres, carrying seven hundred billion board feet, log scale.

Showing possible way of cutting a Douglas Fir log

Durable Douglas Fir

AMERICA'S PERMANENT LUMBER SUPPLY

for Railway Purposes!

Durability—strength. Resistance to weathering. Ability to hold paint. Resistance to checking. Great size and length. Freedom from warping. Light weight—stiffness—name any required property in wood for railroad purposes—and Douglas Fir has it!

Available in every A.R.E.A. combination

EVERY ONE of the sixty-eight different combinations of the coded structural grades of the American Railway Engineering Association can be made in Douglas Fir.

Three structural grades, three timber grades and four special provisions adopted by the mills producing Douglas Fir make this possible.

Usual sizes and lengths are always available at short notice.

Special sizes, including timbers forty inches high and more than a hundred feet long, can readily be supplied *on grade*.

For car construction, Douglas Fir offers great savings, due to its light weight and durability,

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Decking in cattle cars lasts longer when of Douglas Fir, as it is relatively non-absorbent and will withstand hard wear.

For tanks, towers, signal equipment, bridges, trestles, car construction, buildings, cross arms, ties—in fact for every railroad purpose, Douglas Fir is America's most useful softwood.

Write for booklet—use the coupon.

WEST COAST LUMBER BUREAU, 5562-T STUART BUILDING, SEATTLE, WASHINGTON

Durable Douglas Fir

AMERICA'S PERMANENT LUMBER SUPPLY

R-39
Send me your forester's booklet on Douglas Fir

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To WEST COAST LUMBER BUREAU, 5562-T Stuart Bldg., Seattle, Wn.

Important West Coast Woods—DOUGLAS FIR • WEST COAST HEMLOCK • WESTERN RED CEDAR • SITKA SPRUCE

Fort Snelling-Mendota Bridge across Minnesota River near Minneapolis will contain 76,000 cubic yards of concrete. Length 4119 feet. Height, from normal low water to bridge floor, 120 feet.

Walter H. Wheeler, Designing and Consulting Engineer with the C. A. P. Turner Company Associated, prepared the plans and specifications for this job, and is also supervising the construction.



These Engineers Get Quality Concrete Using Economical Mix

QUALITY control jobs now attract attention not because there are few of them, but because there are so many. The Fort Snelling-Mendota Bridge now being built across the Minnesota River near Minneapolis is one of the outstanding examples.

Those in charge of this job are following this basic principle: Assuming a workable mix, the strength of the concrete is determined by the relation which the volume of mixing water bears to the volume of cement.

Field tests, made regularly during the progress of the work, show that predetermined strengths are being consistently obtained.

In addition, grading and proportioning of aggregates within the range of workability are giving the most economical mix and a fine, uniform texture.

Further information about field control will be gladly sent on request, if you will write the nearest office listed below. Ask for a copy of "Design and Control of Concrete Mixtures." There is no obligation.

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

Atlanta
Birmingham
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Big—Bigger—Biggest!

Last year's convention was *big!*

This year's will be *bigger!*

In fact actual Exhibitors' space reservations already made indicate that it will be the *biggest* Convention of the American Electric Railway Association.

It all means more interest, more optimism—and *more buying* by the electric railway companies.

and to get the biggest benefits from the Annual A. E. R. A. Convention — use

ELECTRIC RAILWAY JOURNAL'S *Complete Convention Service*

New attractions for the reader—and new opportunities for the advertiser. A service which will afford the only effective and permanent meeting place for buyer and seller. It will enable you to put *your* message before the entire railway field, the stay-at-homes as well as the Delegates, before, during and after the Convention. This *is* complete service.

Advertising rates on request.

Annual Convention Number dated September 25

A complete volume on the theme of "Modern Cars Pay," written by recognized authorities. The big opportunity to ally your products with the thinking of the industry in the biggest single sales factor in the electric railway industry.

Three Daily Convention Issues dated October 5, 6, 7

The only way to reach every delegate at the Convention. Distributed on three mornings at the breakfast table and at the pier.

Annual Convention Report Number dated October 9

The first and only complete report of papers, proceedings and discussion—mailed 24 hours after the close of the convention.

Electric Railway Journal, Tenth Ave. at 36th St., New York City
Member A.B.C., A.B.P., A.E.R.A.

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

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PERFECT
MICANITE
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Micanite Sheets for all Purposes
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(Yellow or Black)
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Send for catalog and helpful booklet on Commutator
Insulation and Assembly

MICA INSULATOR COMPANY

Largest manufacturers in the world of mica insulation.

Established 1893

New York: 68 Church St. Chicago: 542 So. Dearborn St.
Works: Schenectady, New York. Victoriaville, Canada; London, England

DIXON'S ALUMINUM-GRAPHITE PAINT

Prepared primarily to meet the requirements of gas, oil and industrial companies and particularly recommended wherever a light colored paint is desired.

Back of this new product stands our century-old reputation, as well as 65 years' experience in paint manufacturing.

Dixon's Aluminum Graphite Paint is composed of aluminum and flake silica-graphite as a pigment and boiled linseed oil as a vehicle. The aluminum is of flake formation and thus easily combines with the flake graphite, lapping over like fish scales and providing a covering of unusual elasticity and durability.

The value of flake-graphite as a pigment has been thoroughly proven and is generally accepted. The combination of aluminum and graphite results in a paint that is not affected by gases, fumes, and which resists sunlight, air and moisture. Reflecting light and heat, it will keep the temperature of tanks, etc., considerably lower than is possible with darker paints.

Ask for Circular 180-AB.

Additional information and prices will be sent upon request.

Joseph Dixon Crucible Company

Established 1827  Jersey City, N. J.

PANTASOTE

Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th, 250 Park Avenue Street
NEW YORK

Pantasote Products
for Both
ELECTRIC RAILWAYS
AND
BUSES



Never any Drippings from a Phoenix Electric Refrigerator Car

Ice Refrigerator cars can not be run over elevated tracks in cities because of the drippings from melting ice. Phoenix Electric Refrigerator Cars are free from this objection.

In this connection, they present three other big advantages over ice refrigerator cars.

The cars last much longer because the floors and walls are dry.

They are more efficient because dry floors and walls are better insulators against heat than water-soaked floors and walls.

Dry air makes for better refrigeration than moisture-laden air of the same temperature.

Write for complete descriptive literature.

The Phoenix Ice Machine Co.
Cleveland, Ohio



**PHOENIX
ICE MACHINE**

Type SR Bonding Outfit



Of course you're interested in bonding but—in the shortest time possible

The illustration above shows the Erico outfit that reduces bonding costs for it cuts down time losses in holding up traffic.

The light weight and convenient size of each element of the Type SR Bonding Outfit permits almost instant removal of the equipment.

Hence your interruptions of traffic are reduced to minimum and the time loss of your bonding crew is greatly reduced.

The brazing process of application is simple and sure. Each bond terminal is united to the rail in a welded contact of eight times the cross sectional area of the bond.

Due to the strength of the large area of welded contact, and the absence of injurious heat, Brazed Bonds give long service with practically no maintenance.

Send for booklet explaining complete details.

THE ELECTRIC RAILWAY IMPROVEMENT CO.
2070 East 61st Place, CLEVELAND, OHIO

What Nuttall BP Gears can do for you!



They will stand Four Times the Load

The BP Treatment increases the surface strength of a gear from 60,000 to 240,000 pounds per square inch. Consequently, Nuttall BP gears will carry a load that would break an untreated gear.

R.D. NUTTALL COMPANY
PITTSBURGH  PENNSYLVANIA



Nuttall Helical
Gear Set

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.



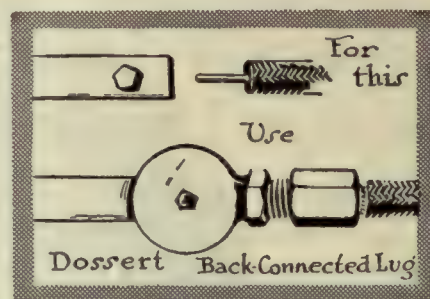
R 11 Double Register

Both our latest single and double registers are now equipped for electric as well as mechanical hand or foot operation.

Full Electric Operation of Fare Registers

A completely satisfactory fare registration system is one that has the confidence of the public, the conductor and the accounting department. The simplicity and accuracy of International Registers maintained for more than thirty years, is combined in the later types with the extra speed and convenience of electric operation.

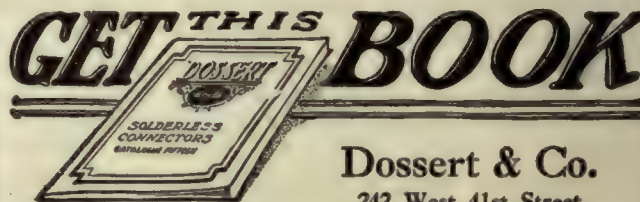
The International Register Co.
15 South Throop St., Chicago



B. C. Lug

The back connected lug is another Dossert—from the large line of standardized electrical connections. All Dosserts have the tapered sleeve principle.

All are shown in the 20th Year Book. Send for your copy.



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You're having brush trouble

**CORRECT IT
USE LE CARBONE CARBON BRUSHES**

They talk for themselves

**COST MORE PER BRUSH
COST LESS PER CAR MILE**

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Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

**No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication**

Earll Catchers and Retrievers
C. I. EARLL, York, Pa.

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The 1926 Edition McGRAW Electric Railway Directory

The time your salesmen can
save would pay for it
many times

"Who are the men I should talk to in the Blank Railway Company?"

You'll find the answer quickly in the 1926 Edition McGraw Electric Railway Directory. Keep a copy handy—in your desk, in your brief case. You'll need it. Call on the right men—the men who specify or buy. If your salesmen cover wide territories, they can't be expected to know all the changes in personnel of the roads they call on.

Our records showed 65% in changes since our 1925 Edition was published.

And your mailing list. Why not *know* in advance that you are reaching the men you *need* to reach. Build and check your mailing lists from the McGraw Electric Railway Directory.

Don't waste valuable time and effort in a \$300,000,000 market by misdirecting your sales program. Save both by returning the attached coupon.

Here are the inside facts

- 1—Complete list of every recorded electric railway company in the United States, Canada, Mexico and the West Indies.
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Price \$7.50 a Copy

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Gentlemen:—Will you please send me:

.....copies of 1926 McGraw Electric Railway Directory, check
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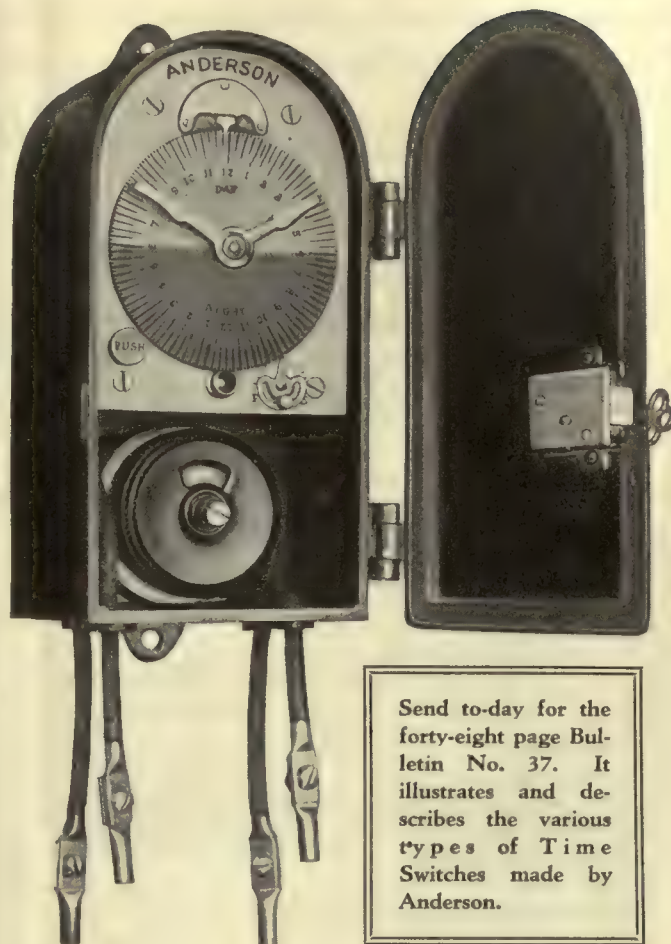
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Send to-day for the
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illustrates and de-
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Switches made by
Anderson.

You can have the utmost confidence in this Time Switch

Because it is designed and constructed with over eighteen years of experience behind it.

The clock, which is the heart of the Time Switch, is built under the same roof as the switch mechanism, insuring a coordination that means dependability wherever and for whatever purpose an Anderson Time Switch may be used.

You can use this Automatic Time Switch for electric signs, illuminated billboards, street lighting, substations, in fact, anywhere, where an electric circuit must be opened and closed at predetermined times with unfailing regularity.

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A true Safety Coach

The life of the Motor Bus you operate is dependent almost entirely on the kind of materials used, and the class of workmanship performed on it. Wherever piece work is involved—rigid inspection of materials, as well as workmanship, is absolutely necessary. P. T. L. inspects motor busses at the point of manufacture from the laying out of the frame through the various stages of assembly to the finished article.

Our Bulletin No. 28 describes this practical inspection service in detail. Write to-day.

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Almco Electric Railway
Automatic
Signals

for Accessibility
and Reliability

EST. 1885 **Almco** INCORP.
"American"
INSULATING
MACHINERY
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REG. U.S. PAT. OFF.

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We make a specialty of

ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULC
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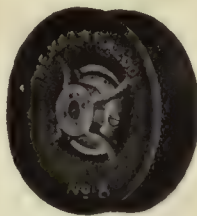
The Universal Lubricating Co.

Cleveland, Ohio

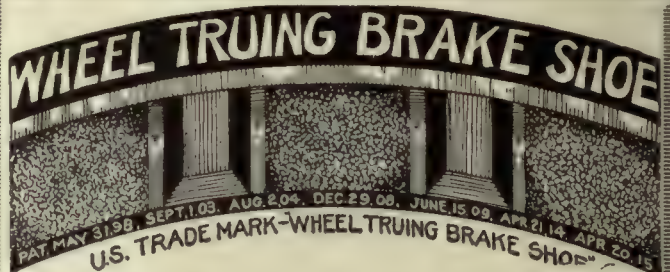
Chicago Representatives: Jameson-Ross Company,
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The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



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KALAMAZOO, MICH., U. S. A.



**DON'T
REMOVE
WORN
WHEELS**

This shoe does the work while your
car is in service.

**SAVES TIME—SAVES LABOR—
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WHEEL TRUING BRAKE SHOE CO.
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Use only Awebco Tape on your Armatures
Field Coils have better protection when wound with
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since 1898 and of Chain Grate
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Tee and Girder Rails; Machine Fitted Joints;
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Trackwork of superior quality,
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Special Track Work of every
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THE BUDA COMPANY

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*The Hardware makes the line
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THE MASTER HEAVY DUTY STEEL
FOR PRESS TOOLS, COMPLICATED SHAPES,
TAPS AND REAMERS.
WRITE FOR OUR INTERESTING BOOK
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LUDLUM STEEL COMPANY
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WE HAVE A SPECIAL TOOL STEEL
FOR EVERY SPECIFIC PURPOSE.

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EMPIRE BUILDING—71 BROADWAY NEW YORK, N. Y.

Manufacturers of Steel Structures of all classes
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Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
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Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
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ELRECO TUBULAR POLES



THE "WIRE LOCK" THE CHAMFERED JOINT

COMBINE

Lowest Cost
Least Maintenance

Lightest Weight
Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO

New York City, 30 Church Street

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

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Car Ventilators
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FOR

ELECTRIC RAILWAYS
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Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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IS Opportunity Advertising

—to help you get
what you want.

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0167

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POSITIONS WANTED

OPERATING executive, superintendent transportation, motive power and equipment. Broad experience and a successful record on city, one-man safety, inter-urban and bus properties; labor, industrial, public relations, traffic problems. Co-ordination of railway and bus service. Desires to re-enter operating field. University graduate. A-1 references. PW-921, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

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Side
Stuckey Co., A.

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Timken Roller Bearing Co.

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Brill Co., The J. G.
Elec. Service Supplies Co.

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Railway Track-work Co.

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Auto Body Co., The

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Wheel Truing Brake Shoe Co.

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National Brake Co.
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Le Carbone Co.
National Carbon Co.
Westinghouse E. & M. Co.

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Brushes, Metal Graphite
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Bunkers, Coal
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Cement Accelerator
N. Amer. Cement Corp.
Cement Products
Portland Cement Association

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Wm. Wharton, Jr. & Co.

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Bethlehem Steel Co.
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Wm. Wharton, Jr. & Co.

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(Continued on page 56)



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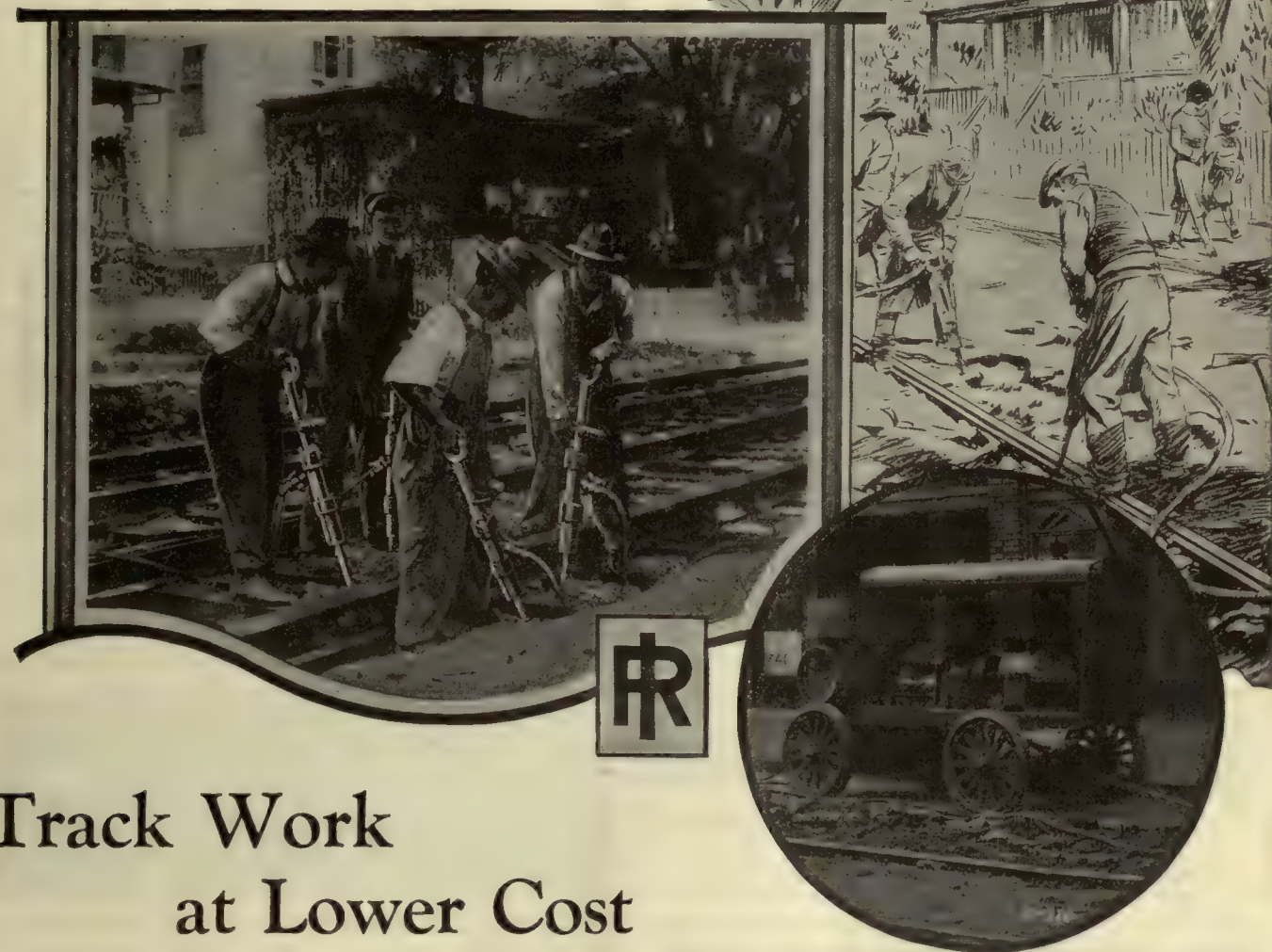
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Pantasote Co., Inc.
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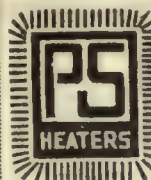
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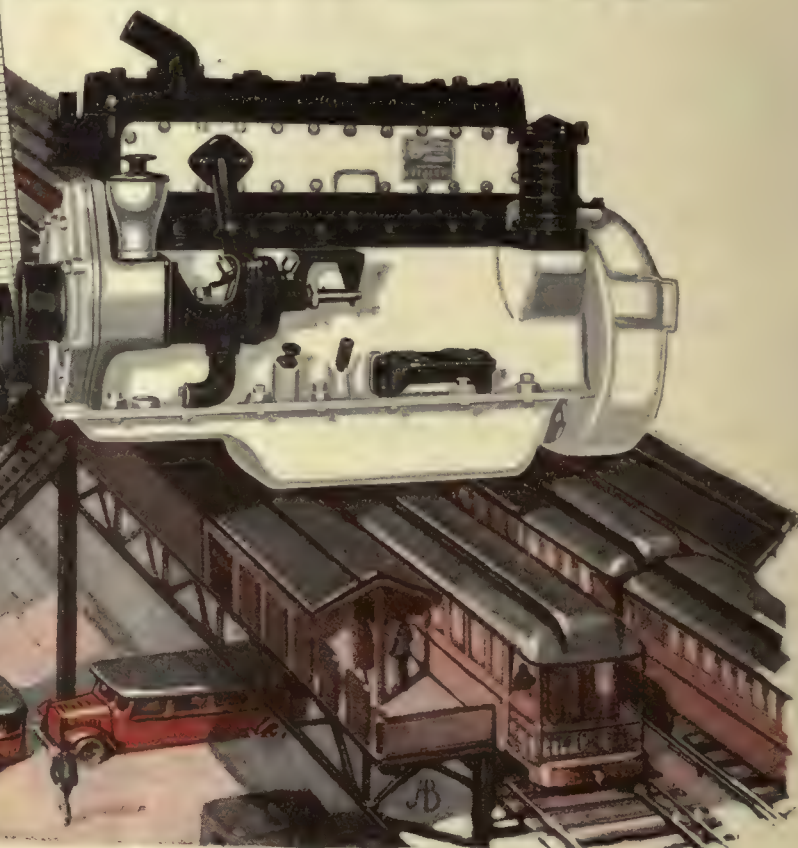
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BOSTON ELEVATED RAILWAY

Month of _____ 1926

MOTOR BUS OPERATION

Number of Buses in service	
Round Trip Operation	
Revenue Miles	
Non-Revenue Miles	
Total Miles	
Bus Hours - Allowed Time	
Bus Hours - Operating Time	
Passenger Revenue	
Revenue - Passenger	
on Route	
at Terminals	
for Parts	
Total Revenue - Passenger	
Total Passenger	
OPERATING EXPENSES	
MAINTENANCE OF EQUIPMENT	
Repairs and Overhauls	
Repairs to Bodies	
Repairs to Chassis	
Tire Repairs	
Repairs to Engines	
Repairs to Storage Batteries	
Total Maintenance	
POWER	
Cost of Electricity	
Cost of Fuel	
Total Maintenance and Power	
TELEPHONE	
Supplies and Materials	
Wages of Employees	
Chassis	
Min. Supplies for Buses	
Storage Expenses	
Storage Expenses - Heating, Lighting, etc.	
Storage Expenses - Repairs	
Other Transportation Expenses	
TOTAL OPERATING EXPENSES	
Taxes	
License Fees and Special Taxes	
Interest on Investment - Bonds	
Interest on Investment - Current	
Total Interest and Taxes	
TOTAL COST OF SERVICE	



Continental Motors



Starting in 1922 the United Electric Rys., Providence, R. I., has continued to show lower operating costs by the use of modern cars.

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Certain Important Factors Influence the Decision to Introduce New and Modern Equipment

According to the report of the A. E. R. A.'s Committee on Essential Features of Modern Cars recently published there are apparently many good reasons which justify the purchase of new cars instead of revamping obsolete equipment.

As pointed out by the United Railways of Providence, they find that their new cars not only accelerate faster, consume less power and reduce track wear, but being modern in all respects reflect

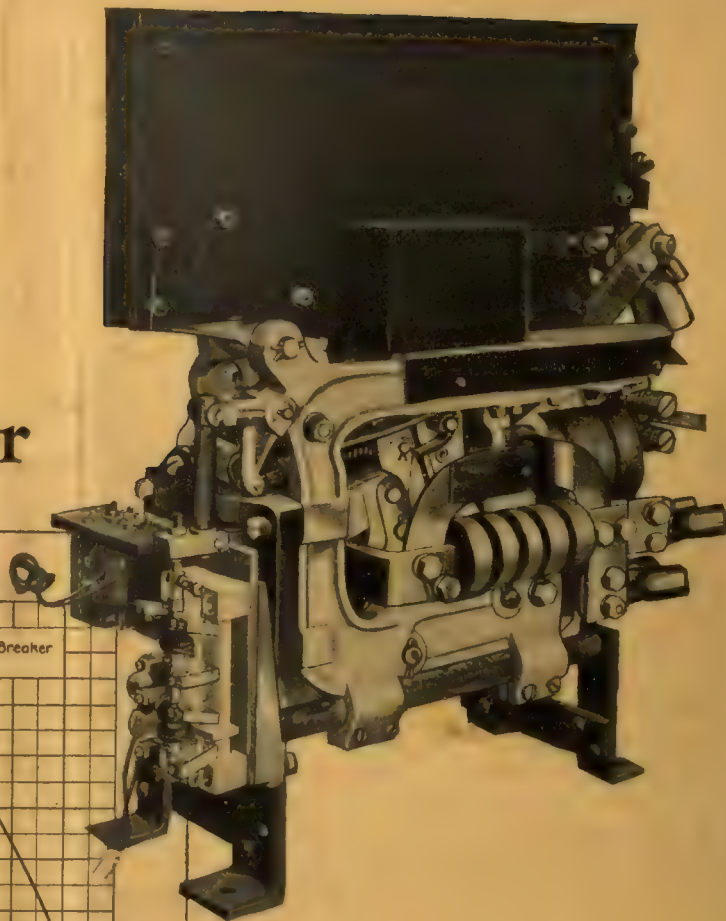
favorably upon the company and the community it serves. Therefore, new cars of modern light weight design not only cost less to operate but, being up-to-date, appeal to the traveling public and result in increased revenue.

Electric railways are able to take advantage of maximum operating economies by the use of new cars and are prepared also to transport their passengers with safety and efficiency.

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GENERAL ELECTRIC

ELECTRIC RAILWAY JOURNAL

A section of the track of the Nashville Railway & Light Co., Nashville, Tenn. This track is cushioned with Carey Elastite Rail Filler.



“It absorbs vibration, and protects the pavement”



says H. C. BENAGH

H. C. Benagh, Engineer of Maintenance of Way for the Nashville Railway & Light Co., Nashville, Tenn. Mr. Benagh has had long experience with electric railway engineering problems, and is a recognized authority in the South.

IN the construction of a T-Rail track along a paved street—especially where the wearing surface is asphaltic—the flangeways are the weak points in the pavement.” That is the view recently expressed by H. C. Benagh, Engineer of Maintenance of Way for the Nashville Railway & Light Co., Nashville, Tenn.

“The dust and dirt accumulating in these flangeways are packed and crushed downward into the wearing surface. This causes a rupture of the street paving, and rail vibration tends to make the situation worse.

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These new cars bring better trolley service to Richmond, more comfortable and convenient service. Each

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No. 7

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News!

IN ADDITION to its other functions, the JOURNAL is a weekly newspaper of the electric railway industry. Regular correspondents are located in the leading cities of this country and Canada. An office is maintained in London and important transportation developments throughout the civilized world are reported by special correspondents located at strategic points.

News correspondents visit frequently the railway offices in their territory. They are trained newspaper men and know the value of "news" while it is timely. Telegrams and air mail are used freely to get important new developments before the industry at the earliest possible moment. It is not at all unusual for the JOURNAL to print important general or financial news of the industry before it reaches the daily papers, despite their elaborate news-gathering mechanism. The co-operation of many railway men who make a practice of mailing or wiring at our expense news of developments on their own properties for the information of the industry has been no small factor in making these results possible.

The large volume of news material received each week is carefully culled, selected and condensed, in order to save the reader's time and give him the pertinent facts. The policy of the News Department is to give the facts fully and concisely, yet in a readable way; to confirm the correctness of information received and to print it uncolored, without fear, favor or malice.

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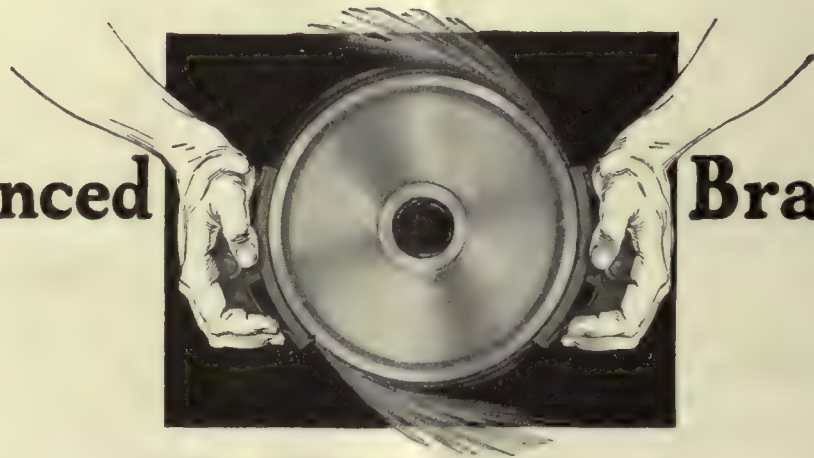
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Balanced



Braking

In line with modern principles

Higher rates of retardation are demanded as a part of the program of speedier suburban and street railway service. With two brake shoes per wheel instead of one, the clasp brake is admirably suited to producing maximum retarding effect, with minimum strain and wear on truck and journal parts.

Balancing the heavy braking forces on opposite sides of the wheel has many advantages

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Less journal box wear. 2. Permits wheel to follow freely, vertical inequalities in track. 3. Makes use of flanged brake shoes practical. 4. Higher co-efficient of friction. | <ol style="list-style-type: none"> 5. Divides energy absorption between two shoes, thus reducing heating effect from brake application. 6. Reduces frequency of brake shoe replacements on the car. |
|--|---|

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS

American Multiple Unit Clasp Brake





Tomlinson Couplers for 100 New Chicago Surface Lines Cars

TO PROVIDE its usual high standard of service for three-fourths of the riders in Chicago, in the presence of a phenomenal increase in street car riding, the Chicago Surface Lines recently purchased 100 additional new cars, equipped for multiple unit operation.

On all these new cars Tomlinson Automatic Couplers, Form 10, are standard equipment. Previous use which demonstrated the effectiveness of Tomlinson Couplers, led to this repeat order.

Always in alignment, ready for action, and fully automatic in operation, these couplers insure safe, convenient and rapid assembly of cars in rush periods. And the design and construction are such as to give long, care-free operation under the widely varying conditions which must be met in city service.

Complete details gladly sent on request, without obligation.



Electric Disconnecting Switch
for Tomlinson Couplers

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada

164C

Ohio Brass Co.

PORCELAIN INSULATORS LINE MATERIALS RAIL BONDS CAR EQUIPMENT MINING MATERIALS VALVES

Buyers who buy specially treated poles for their long years of service help check waste of trees. Thus the Yearstick, a measure of service, becomes also a measure of forest conservation.



The Yearstick— a new measure for pole buyers

THE yardstick tells you the dimensions of the poles you buy. That's all. But a new measure, the Yearstick, measures what you cannot see—the years of service.

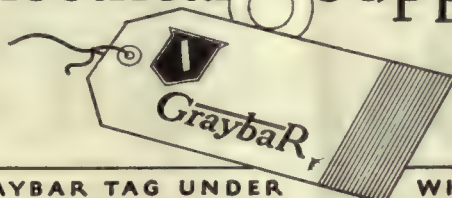
When you buy poles, apply the Yearstick—and see the long years of service in a specially treated pole. Careful pole buyers have found that pine poles, for instance, creosoted by scientific pressure treatment, defy rot and moisture, and that the active life of a pole so treated is doubled.

Let Graybar Electric specialists show you how treated poles measure longest—by the Yearstick.

OFFICES IN 58 PRINCIPAL CITIES. EXECUTIVE OFFICES, 100 EAST 42ND ST., NEW YORK.

GraybaR

Successor to Western Electric Supply Dept.
Electrical Supplies



THE GRAYBAR TAG UNDER WHICH 60,000
QUALITY ELECTRICAL SUPPLIES ARE SHIPPED



An American Product that goes abroad *must* be good

THE merits of Twin Tie construction are getting the rapid recognition of foreign engineers, a test for any product in the face of low costs abroad and unfavorable rates of exchange for the foreign buyer.

In 1925 shipments were made to Barcelona in Spain, Birmingham, England, Monte-

video, Uruguay, Rio de Janeiro in Brazil, Havana, Cuba and to Mexico City—nearly 9 percent of our total business was for export. This does not include the Canadian Electric Railways whose Twin Ties are made in Canada of Canadian steel by the Sarnia Bridge Company of Sarnia, Ontario.

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track — Permanent Foundation

SNOW!



*it's sure
to come*

Get ready now—check up on
your snow-fighting equipment
for the coming winter

McGuire-Cummings Single and Double
Truck Snow Sweepers and Plows are
“Standard Equipment” on practically
every Electric Street Railway Line in the
United States and Canada that has snow
to contend with.

CUMMINGS CAR AND COACH COMPANY

Successors to McGuire Cummings Mfg. Co.

111 W. Monroe St., Chicago, Ill.

Light Weight City and Interurban Cars

Single and Double Truck Snow Sweepers and Plows

ESSCO BULLETIN

Devote this week
to improving —

Convenience!

Keep these always
in mind ———

*Safety
Publicity
Illumination
Convenience
Maintenance*

TO HAVE reliable push buttons within easy reach of every passenger is a convenience greatly appreciated by the riding public.

The use of Faraday Passenger Signal Systems assures this reliable service to your passengers at all times. They eliminate the chance of numerous complaints and arguments about not stopping at the proper corner.

Let us send you more complete information.

ELECTRIC SERVICE SUPPLIES CO.

PHILADELPHIA	NEW YORK	CHICAGO
17th and Cambria Sts.	50 Church St.	Ill. Merchants' Bank Bldg.
PITTSBURGH	BOSTON	SCRANTON
1123 Bessemer Bldg.	88 Broad St.	316 N. Washington Ave.
DETROIT—General Motors Building		
Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver		

FARADAY CAR SIGNALS



Type B
Push Button



Type A
Push Button



No. 19403
Buzzer



FARADAY Car Signal Systems are made for every requirement—high or low voltage systems, buzzers, vibrating bells or single-stroke bells, resistance panels, flush or surface type push buttons.

TIMKEN



In Detroit

— where the city's rapid growth has congested the streets with a terrific flow of traffic, the Detroit Motorbus Company operates 243 motor coaches — equipped with Timken Axles, front and rear.

These vehicles are averaging 968,000 miles per month, and the operating company reports, "Axles are rendering extremely satisfactory service."



THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

AXLES



Building up a

**YELLOW
COACH
FLEET**

in Washington

by the

WASHINGTON
RAILWAY and
ELECTRIC CO.





They started with 2



From two to twenty-one—within a year!

Just about one year ago the Washington Railway & Electric Company bought their first Yellow Coach. Adding new equipment, as the need arose, they now operate 23 Yellow Coaches; 18 Type Z, 6-cylinder 29-passenger type and 3 type X.

That's the way the Washington Railway & Electric Company has been building its fleet of Yellow Coaches, choosing Yellow Coach equipment on the basis of performance.

Washington's riding public looks to the Washington Railway & Electric Company for good transportation service. Communities not served with street cars demand motor coaches to bring them to the shopping and business sections. The operations of the traction company provide, in many cases, that traction service be augmented with auxiliary coach lines, carrying a transfer privilege.

And into this picture fit Yellow Coaches, bearing the brunt of motor coach service and representing the majority of coach equipment.

Behind the growth of this Yellow Coach fleet are reasons that account



for Yellow Coach selection by the Washington Railway & Electric Company. Investigation shows that—

- 1 The railway company is convinced that Yellow Coaches are past the experimental stage. It knows that in buying Yellow Coaches it takes no chances.
- 2 That the equipment has been free from mechanical trouble, thus proving reliability of service on the road, where money is earned.
- 3 That despite constant starting and stopping, Yellow Coaches have failed to develop any weakness. They are built to stand the gaff, and are demonstrating this ability.
- 4 That, after careful comparison and operating check-up, Yellow Coaches are looked upon as a very finished piece of work and a safe investment.

Such reasons form a good gauge for buying, and in all parts of the country operators are increasing their Yellow Coach fleets and standardizing on Yellow Coach equipment. They are duplicating the findings found at Washington and investing accordingly.

The engineering skill and vast operating experience of Yellow Coach *plus* the unlimited technical resources of General Motors assure economy of operation, financial stability and freedom from all danger of orphan equipment.

YELLOW TRUCK & COACH MANUFACTURING CO.

SUBSIDIARY GENERAL MOTORS CORPORATION

5801 WEST DICKENS AVENUE, CHICAGO, ILL.





THEN AND NOW

IN THE early days of transportation, the opening of a carriage, railway coach or chair door was a slow and pompous ceremony. Today—in cars equipped with National Pneumatic Door and Step Controlling Mechanisms—the opening of a door is equally as courteous but much quicker and far more convenient for the passenger as well as for the men who operate your cars.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building



American BROWN BOVERI

1. High efficiency

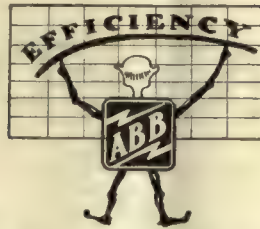
From less than one quarter rated capacity to loads far above rating, the efficiency curve is high. Not merely high, but materially higher than for the standard rotary converter of equivalent capacity.

Where load fluctuations are so extreme and so constantly in progress, as in electric railway operation—the mercury arc power rectifier will pay for itself in actual savings at the A. C. switchboard.



Principal Products

Mercury-Arc Power Rectifiers (steel enclosed)	Mining Locomotives	Relays
Electric Locomotives—for any system of current, high or low tensions	Switches, Controllers and all Auxiliary Equipment	Turbo Compressors and Blowers
Complete equipment for rail- way electrification	Steam Turbo Generators for normal or high pressures	Electric Furnaces
Rotary Converters	and superheats	Induction Regulators
Motor Generators	Automatic Regulators	Ships
Diesel-Electric Locomotives	Oil Switches	Diesel Driven
	Condensers and Auxiliaries	Turbine Driven
		Electrical Driven
		Structural Steel Fabrication



Mercury-Arc Power Rectifiers

over wide range of load!

Chief Advantages

- (1) Efficiency high over the whole working range.
- (2) Simple operation and minimum attention.
- (3) No synchronising.
- (4) Very high momentary overload capacity and insensibility to short circuits.
- (5) Negligible maintenance.
- (6) Low weight. No special foundations.
- (7) Noiseless and vibrationless operation, consequently rectifier substations can be erected in densely populated localities.
- (8) New sub-stations need only be of light construction. In many cases old houses can be converted, while the plant can often be erected in places that could not be considered for rotating machinery.

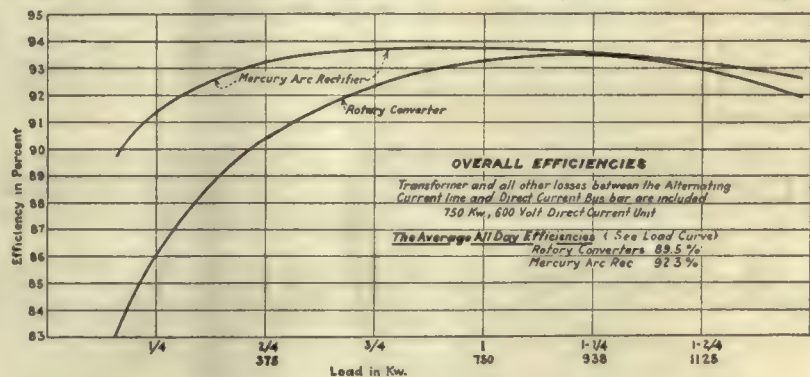
With a BROWN BOVERI MERCURY ARC RECTIFIER, characterized by unusually high efficiency at partial loads, the Average Converting Losses are, at extremely Low Load Factor, cut down tremendously, even at Rail Voltages as low as 600 V.

Below is shown what can be done in an Actual Case by the use of Mercury Arc Rectifiers. The reference is to an Inter-urban Railroad in one of the Eastern States. The substation

rating is 750 Kw.-H., 600 V. The part of a record roll reproduced on this page shows the usual output over a period of six hours.

The AVERAGE ALL DAY OVERALL EFFICIENCY was found to be:

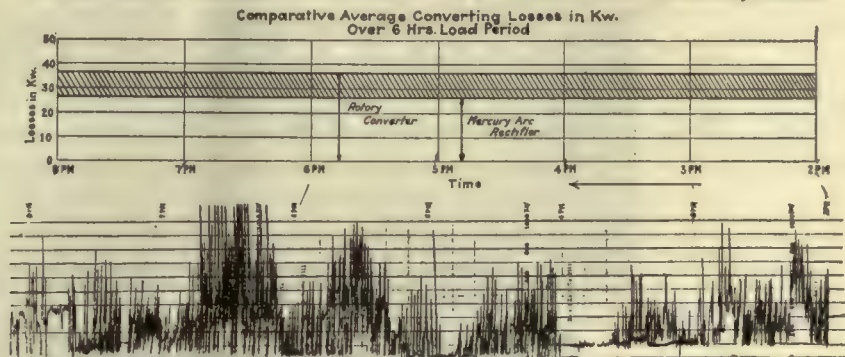
for Rotary Converters..... 89.5%
for Mercury Arc Rectifiers..... 92.3%



The saving obtained in six hours (represented by the shaded area) when extended over a 20-hr. day, amounts to MORE THAN 200 KW.-H., or, at 1c. per Kw.-H., THE ANNUAL SAVING effected is \$730.00, which is

the INTEREST on MORE THAN \$10,000.00.

In addition to the power saving, the maintenance cost will be less than half as much as with rotary converters.



American Brown Boveri Electric Corporation

165 Broadway, New York, N. Y.

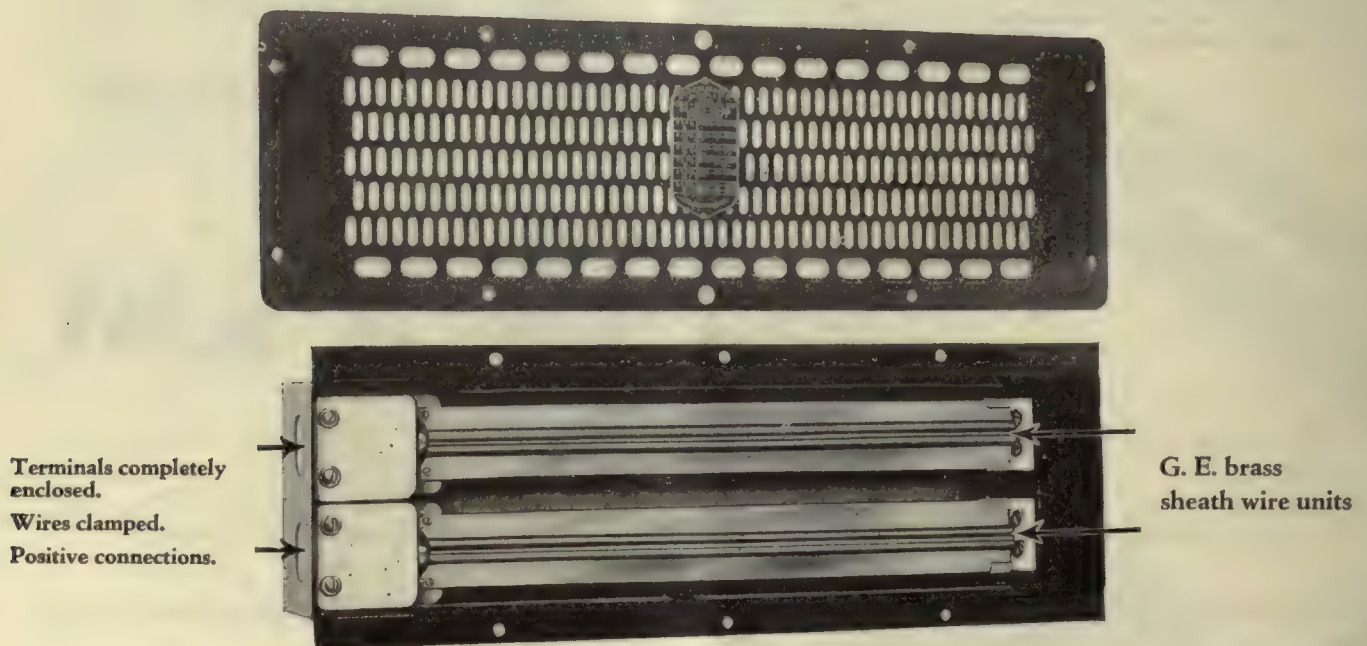
Camden, New Jersey

230 South Clark Street, Chicago, Illinois

AMERICAN BROWN BOVERI

CONSOLIDATED HEATERS *for* ARTICULATED CARS

Thirty-five units (105 cars) of the new Articulated Triplex Subway cars of the New York Rapid Transit now being built are to be equipped with Consolidated Car-Heating Co.'s enclosed type Electric Heaters.



CONSOLIDATED CAR-HEATING CO.

CHICAGO

ALBANY

NEW YORK

Memphis Street Railway

—installs New Modern Cars—
—stream line painting and plush upholstered seats

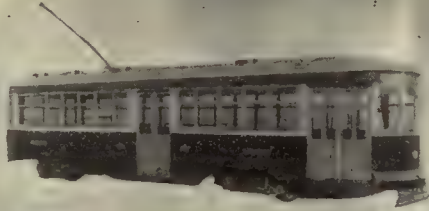


32 of these new cars *just delivered*
to Memphis Street Railway by the
Quality Shops



Further particulars on request

St. Louis Car Company
St. Louis, Mo.



in Philadelphia

Service Talks

PHILADELPHIA RAPID TRANSIT COMPANY
Under Mitten Management

June 22, 1926

Vol. 7, No. 14

WHY THE ONE-MAN CAR

Rumblings are occasionally heard against the one-man car. To Mitten Management, however, and to the car-riding public, this form of transportation has sold itself because it has enabled P. R. T. to increase service, at the same time showing a better accident record than two-man operation. If it were not so, P. R. T. would be the last to advocate its use, since accidents aside from the humane standpoint, are the most costly by-product of transportation.

Mitten Management recognizes as its greatest problem the desire on the part of car-riders for better service as expressed in more seats to passengers carried. The one-man car is a step in this direction, because it is cheaper to operate and permits of more service for the same cost. When operated in connection with subway fare collection, it also enables a speeding up of service. The one-man car is particularly expedient at this time, in that economical operation is essential if P. R. T. is to help carry the operating loss resulting from Broad street subway operation.

The Philadelphia Rapid Transit Company now operates over 900 cars equipped with Safety Car Control Devices that permit one-man operation. This practice represents one phase of the Mitten Management's Policy to create public good will by giving transportation worthy of the city it serves, and giving it in perfect safety.



SAFETY CAR DEVICES CO.

OF ST. LOUIS, MO.

Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH



...each, in fact dis-
...the reception room in front is
...mechanical arrangement
...furnished in the style used during the
...Colonial period.

EXCLUSIVE BUSES FOR RICH PATRONS

Kansas City, June 25.—Kansas City is operating de luxe buses "for millionaires." The busses make the trip to the city's most select residential district and charge 25 cents a passenger.

The busses are the limousine type, equipped with every safety device. The exterior is painted in blue and gold. The seats are richly upholstered with overstuff cushions and soft velvet carpets are on the floors.

Dainty blue drapes cover the large glass windows, harmonizing with the deep color scheme of the interior decorations.

The busses make it possible for patrons to travel to and from town on regular schedule with all the comforts of their own motor car, eliminating traffic and parking difficulties.

ORDERS PLACED FOR MORE GAS ELECTRIC CARS BY RAILROADS

Philadelphia, Pa., railroad company have

*Westinghouse
Air Brakes!*



WESTINGHOUSE TRACTION BRAKE CO.
AUTOMOTIVE DIVISION
General Offices and Works, WILMERDING, PA.



HAND CONTROL

WESTINGHOUSE

Automotive AIR BRAKES

FOOT CONTROL





Grade-M Gearing typifies those products of General Electric which have profited so much from adequate facilities as well as from a sincere desire to produce equipment that will render the fullest measure of satisfying service.

DAY after day Grade-M Gearing is making new records of superlative service. Despite the exacting conditions from which the operation of railway gears and pinions is inseparable, Grade-M continues to exhibit an endurance that measures up to the highest modern standards.

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, August 14, 1926

Number 7

The Radio Sells Rides at Melbourne

ELSEWHERE in this issue appears an abstract of a radio talk by W. O. Strangward, secretary of the Melbourne & Metropolitan Tramways Board, on the ticklish subject of "Tramway Finances and Fares." One may suspect that the average radio listener is not keen on hearing statistics and why his fare had to be increased, but a reader of the article will realize that Mr. Strangward's simple and pleasant handling of the subject must have brought the subject home effectively to his listeners. Some of the flavor has remained even in the abstract imposed by space limitations.

This talk is only one in a series of twenty-minute lecturettes broadcast every fortnight by heads of the different departments. Thus the chairman has discussed "The Constitution and Activities of the Board"; the chief engineer, "Building a Tram Line and Planning the Tramway Development of the Metropolis"; the manager, "How the Trams Are Run"; the rolling stock superintendent, "The Building and Maintenance of a Tramcar," and one of the staff officers, "A History of Melbourne's Street Transportation."

It is quite obvious from the foregoing alone that the Melbourne tram-bus system is heartily in accord with the "tell-the-people" policy which our own W. H. Sawyer recently recommended to the government light and power officials. Furthermore, our Melbourne brethren have gone American trolley broadcasters a kangaroo's jump further through weekly use of the radio for direct ride-selling suggestions. For ten minutes every Friday night the radio fan receives suggestions on how to use the service for travel to this or that pleasure objective on Saturday and Sunday. The best proof that these "lecturettes" and shorter talks are appreciated is that the broadcasting station makes no charge for this valuable contact with the public.

Bus Progress in Europe

WHILE the use of the bus as an integral part of the general transportation system has been progressing rapidly in this country, development in Europe has been somewhat less extensive. The total number of buses now in operation in Europe is not much more than 30,000, as compared with about 80,000 in the United States.

In the United Kingdom the number is estimated to be approximately 18,000, of which some 5,500 are in London. The latest figures obtainable from official sources in France, appearing elsewhere in this issue, show a total of 4,500 buses in operation, of which 1,368 are in Paris. Throughout the rest of Europe the best available figures indicate that there are not more than 10,000 additional buses.

London and Paris have more bus service than cities

of corresponding size here. Outside of these two capitals, however, bus operation has not been developed on a scale comparable to that in the United States. Interurban service in Europe has lagged far behind its counterpart in this country.

Compared to the situation in Europe, development has progressed with remarkable rapidity here. Today nearly all the large American cities are planning additional bus service. Intercity service has been growing by leaps and bounds. The contrast illustrates once more how the riding habit has been developed in the United States and how greatly the transportation demands here exceed those of other countries.

Latent Public Opinion Aroused at Newark, Ohio

NEWS of the shutting down of the Southern Ohio Public Service Company's electric car and bus operation in Newark is published elsewhere in this issue. Reports of the causes of this action make a story of political chicanery startling in its stark disregard of the best interests of the riding public. As usual the man on the street was unaware or uninterested in the machinations of his representatives until they resulted in the loss of a valuable service. Only then did the public itself take cognizance of the plight of its transportation company. But, bad as the situation appears on its face, there is now a ray of hope in the attitude taken by the public, once the facts were brought home by a shut-down in service.

The system at Newark is a part of the old Columbus, Newark & Zanesville Electric Railway that has twice passed through receivership and about a year or so ago emerged from a second reorganization. Zanesville, a part of the same system, has granted the new company a favorable franchise and is now receiving an excellent service with twenty new cars and several high-grade buses. Shortly after the Zanesville settlement Newark granted a similar franchise to the company for 25 years. In accordance with the terms of this franchise the company asked the Council for a 10-cent cash, four for 25 cents fare, the same as has existed in Zanesville for many months. No action resulted, and an attempt by the company to institute this fare resulted in an injunction. But the city went further. It granted a city-wide franchise at a 5-cent fare to an independent bus line despite the terms of the railway franchise. In an attempt to provide service the company had previously co-ordinated all bus operations with its own by buying up the almost worn-out competing buses and had acted in good faith in an attempt to provide an adequate service in Newark.

So much for history. No sooner had operations ceased than an indignation meeting was held that vented its wrath against the Council and the new bus

company alike. A special meeting of the Council called for Tuesday night was not held; perhaps the indignation meeting of 600 citizens was too ominous.

At first blush, the Newark situation looked like another abandonment, and perhaps it may so result, as the company is justly firm in its decision. But despite the seeming apathy of the public during the negotiations, it now manifests an interest in the situation that promises to bring quick and definite action. It is this aroused public opinion, grounded in a faithful performance of public service, that renews faith in the security of a public transportation service founded on public friendship.

Balanced Consideration Important in Improving Cars

INTEREST in the improvement of electric railway cars is growing apace in the industry. There is evidence on every hand that railway operators and car manufacturers are taking active steps to provide cars with features that will be attractive to passengers. There is a stimulated interest in paints and finishes, floor covering and seat materials. The industry is beginning to move definitely toward the objective of supplying its rides in a more attractive package.

Now, however, that the industry has begun to make definite progress in improving its cars a word of caution may not be amiss. Here and there are indications that rapidly growing enthusiasm may soon result in overstepping the bounds of practicability. Attractiveness of finish and fittings does not call for "doodads." Street cars are mass transportation vehicles, and any features which are obviously unsuited to such service become incongruous. The limits of both good taste and reasonable maintenance cost may be easily exceeded. If this is permitted to occur the very object for which improvements are made will be defeated.

As in the case of light-weight construction, one-man operation, use of buses and similar movements which have taken place in the industry there is a tendency in some instances to swing from one extreme of the pendulum to another. From slat seats to lace curtains offers a range within which there is a happy medium of desirable and practicable improvement.

In such a movement as this there is also a tendency to grab a hobby and ride it hard. A particular color, a type of floor covering or seat material is not a short cut to attractive cars. A given seat material may or may not be justified under certain operating conditions. But it is only when judged in combination with the general character of the rest of the interior that the final effect produced can be determined. On the exterior paint helps materially and it covers a multitude of sins. But the paint in itself will not entirely compensate for awkward lines and angles that result from inadequate consideration of the general effect produced. The exterior lines and appearance of cars may well be the subject for much more attention than this phase of design is receiving.

All this may be summarized in the single word "balance." In the past there was a tendency to abandon considerations of merchandising attractiveness in the effort to achieve economy of maintenance. That policy has proved to be unwise. In the new movement looking to more attractive cars, however, consideration of maintenance economy must not be entirely abandoned.

A Victory Without Laurels in California

MOVING horrors in California are something of an anomaly. With "movie" horrors the case is different, but that is neither here nor there. One of the California cities recently had what some were inclined to think was a moving horror. The case got into the courts, but the judge decided on the basis of the facts, and the facts alone. So the electric railway won the right over the city's objections to use advertisements on the outside of its cars. The learned jurist admitted that the advertisements in question were not pleasing to the eye, but added that the esthetic was not a consideration in deciding what constituted the peace and safety of the citizens. Thus one sees the limitations of the law and likewise its impotence as a social force.

But the need for things of beauty in car advertising is not indigenous to that state. Once a railway imbibes the psychology of picture advertising as regards the transportation business its esthetic sensibilities will be too keen to permit inharmonious insignia to screech their messages from the side panels of the cars. This increasing appreciation of the need of art in industry has been stressed before in *ELECTRIC RAILWAY JOURNAL*, notably in the issue of Aug. 22, 1925. It is being achieved in increasing measure in this industry. Art in industry is not unattainable. Only a few weeks ago the *New York Times*, in commenting on the advertising show at the fifth annual exhibition of the Art Center in New York, said that the exhibit displayed "increasing ability of artists, working in harmony with the demands of business, to produce pictures of intrinsic beauty and merit."

Considering the enormous sums of money being expended yearly to perfect art in advertising and the resultant stimulating effect on the public, it should be construed as an arraignment for a judge to rule that the advertisements were more or less of an eyesore even if the safety of the patrons were not impaired. The slogan "it pays to advertise" has long since been amended to "it pays to advertise well." Witness the heights to which soap, soup and sermons have transported us in recent years. In view of the court's comment the California railway won a legal and technical victory only. Some day when a judge rules that advertising on the outside of cars is permitted because it is a mental and moral stimulus the victory for the railway will be a glorious one.

Soliciting Contributions with a Club

THERE exists in the utility industries an insidious practice. It is the policy of exacting tribute from manufacturers in the form of advertising in house organs, subscriptions to employees' benefits, purchase of customer-ownership stock and similar forms of "voluntary contributions" which are unwarranted impositions upon the seller's relationship with the purchaser.

Should a railway wish to encourage a benefit performance for its disabled employees, then immediately the equipment manufacturers who have enjoyed this company's trade in the past, or who hope to share in it in the future, are "invited" to take a page in the program which is to be sold at the performance. Should the mutual aid association of some utility find that its monthly bulletin is proving somewhat of a burden, there

is always the opportunity graciously to allow a few manufacturers to express their friendship for the purchaser by taking space in the publication. Should a utility decide to sell a block of stock to its customers to encourage community interest in the company's welfare, again the manufacturers are canvassed to participate, although it could hardly be imagined that their friendliness toward the utility needed bolstering up.

The practice has reached a point where some one ought to ask the utilities to consider these requests in their true light. They are not justifiable requests. In each particular instance the amount at stake is no very disconcerting sum. And often the cause is a worthy one. But the manufacturer must deal not with one case nor with ten, but with hundreds of such proposals every year. In one instance the annual outlay in these channels reached nearly 1 per cent of the gross income for the year or an amount which, if added to net profit, would increase the sum available for dividends by 6 per cent.

There is no reasonable ground for levying tribute against the manufacturer under the guise of advertising. This is simply an indirect way of soliciting contributions—with a club in the hand of the solicitor. Customer ownership of stock is an excellent plan for raising capital and building good will, but manufacturers selling to the utilities are not customers and they cannot afford to tie up their funds in such paper. Such transactions are based on the relationship between buyer and seller in a way that transcends the limits of modern business ethics.

Traffic Congestion Relief

Needs More Active Community Spirit

ACTIVITY by railway men in grappling with the growing seriousness of traffic congestion in American communities is not only justified by their direct interest in the mitigation of this widespread evil but is to be commended as a public-spirited effort to apply their experience as transportation men to the service of their communities.

There is always danger, however, that their motives may be questioned. The very growth of traffic congestion to its present intensity is attributable in large part to the number and variety of interests responsible and affected. There has been a lack of any agency which on the one hand had the incentive to tackle this situation seriously, while at the same time having a broad enough community consciousness to knit together the many diverse elements interested in some phase of the problem.

It is becoming increasingly evident that the local common-carrier transportation companies have the broadest interest in the subject, and that where the approach is made in such a way as to eliminate any suspicion of selfishness, they can lead the way to effective improvement. In Chicago notable relief has been accomplished through the efforts of the Chicago Surface Lines, working in conjunction with the Association of Commerce.

Retail merchants are quickly alert to any move in the direction of traffic regulation. Real estate boards, automobile and automobile supply dealers, and shippers are all directly interested, in addition to the general automobile driving public, both as individuals and through automobile associations. In general, the attitude of most of these groups tends to become a defensive one whenever the subject of traffic regulation is approached.

In most instances the interests of the community as a whole take a secondary position.

Success on the part of local transportation men in taking the leadership looking toward congestion relief is dependent to a large extent on their own breadth of view and method of approach. Local chambers of commerce furnish an excellent medium for contact with the other agencies affected. When this contact is made with a flexibility of mind that permits the other fellow's position to be so thoroughly understood that his co-operation may be won in making unbiased studies to determine the facts of the situation and their effect on his own business, definite progress toward relief may be expected.

Properly Designed One-Man Cars

Earn Their Way to Popularity

MODERN one-man cars continue to show real improvements in operating conditions wherever they have been instituted with due regard to traffic requirements. An example of the case in point is found in the experience of three Fitkin properties which have recently taken definite steps to expand this form of operation. As recounted elsewhere in this issue, the Youngstown, Scranton and Altoona properties placed orders toward the end of last year for a number of light-weight one-man cars to be used in the various communities served. These cars have now been in operation for several months and have elicited nothing but words of commendation from railway men and patrons alike.

Of course the usual number of knockers were on hand to foretell dire happenings, such as retarded schedules, accidents and sundry evils. But no satisfaction has been accorded them; their prophecies have succeeded in arousing nothing more serious than the badinage of local wits, and the cars themselves have justified their existence from the first in reduced operating costs and in improved public good will. Particularly noticeable has been the evident pride in the equipment taken by the men who have been selected as operators of the cars. They feel the greater responsibility which has been accorded to them and measure up to it with an appreciable improvement in personal efficiency.

Here is an important element in the successful introduction of one-man operation. New and attractive equipment designed specifically for operation by one man helps to "sell" the new idea to both public and employees through the obvious improvement which is made. Remodeled old equipment lacks this "selling" feature and much of the opposition to one-man operation is attributable to attempts to utilize former old and heavy two-man cars.

The success of the venture was not prejudiced by a lack of adequate publicity on the part of the railways. In Youngstown, where the one-man car was being tried for the first time, a thorough educational campaign was conducted prior to the inauguration of the service to banish any prejudices which might be held by patrons of the lines affected. This is the essential step which all railway managements should take in making a similar change-over from two-man operation. If a person knows all about a thing he is less likely to shy away from it when asked to accept it as an everyday factor in his life. So a stressing of the manifest advantages of one-man cars cannot but prove beneficial as a preliminary step.

Record Cards of Many Types Used by Boston & Worcester Street Railway In Connection with Its New Bus Operations

Daily Gas and Lubrication of Vehicles

Bus 7 MONTH 19

Day	Mileage	Gas Used	Miles per Gal.	Qts. Engine Oil Used	Miles per Qt.	Lbs. Cup Grease Used	Miles per Lb.	Lbs. 600W Used	Miles per Lb.
1	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
2	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
3	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
4	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
5	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
6	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
7	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
8	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
9	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
10	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
11	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
12	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
13	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
14	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
15	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
16	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								
17	Rev. Vehicles								
	Non Rev. Vehicles								
	Other Vehicles								

Daily Garage Report

Vehicle No. Time Out Time In Reason In Speedometer Reading Speedometer Miles Date

Boston & Worcester Street Railway Company
CONDITION OF MOTOR VEHICLE
INSPECTION AND REPAIRS

DATE 19

VEHICLE NO.

Inspector's Name Mark Ok. or REP. if Required Inspector's Name

ENGINE
Starting Crank Test
Connecting Rods
Main Bearings
Crank Gears
Wrist Pins
Crank Pins
Push Rods
Valves
Valve Springs
Cam Shaft Bearings
Shocks

CLUTCH
AXLE, Front
Rear
Differential
SPRINGS, Front
Rear
Cross
Hangers
Shackles

COUNTER SHAFT BEARINGS
SPROCKETS
SHAFTS
WHEEL BEARINGS
Hubs
Front Wheel Alignment
Rear Wheel Alignment

TRANSMISSION
Shifting Rod Pins
Gear Shift
FRAME
Cross Member Back of Motor
Sub Frame
ELECTRIC Starting System
Lighting
Body Outside
Inside
Doors
Seats
Windows
Guards
Fare Boxes
Destination Signs
Heaters
Fare Extender

FILL IN REVERSE SIDE OK

DAILY AIR CHART
Boston & Worcester St. Ry. Co.
Bus No.

Month

Date	FRONT		REAR			
	Left	Right	R. Outer	R. Inner	L. Inner	L. Outer
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						

DAILY BATTERY CHART
Boston & Worcester St. Ry. Co.
192

Date

Bus No.

Bus No.

Bus No.

TIRE RECORD

MAKE SIZE DATE RECD. NO. MFG. NO. COST COST PER MILE

Month

REASON REMOVED

Bus No. Wheel No. Date On Date Off

TIRE CHANGE RECORD

Operator or Mechanic

Coach No.

Time

Position (check in square the tire removed or applied)

Front, Right ☐ Front, Left ☐ Rear, Right, Outside ☐ Rear, Right, Inside ☐ Rear, Left, Outside ☐ Rear, Left, Inside ☐ No.

Spare Tire ☐ Make

Tire Removed—Make

Tire Applied—Make

Speedometer Reading at Time of Change

Send to Chief Engineer

NOTE—To be used by Garage Foremen Only

DAILY GASOLINE REPORT

Vehicle No. Pump Reading Gal. Recd. Gal. Ret. Speedometer Reading Date



Intercity Bus Operated by the Boston & Worcester Street Railway Passing the Historic Wayside Inn at Sudbury. The Highway Route Between Boston and Worcester Traverses Different Territory from that Served by the Electric Railway Line

Recovering Revenue Through Bus Operation

Boston & Worcester Street Railway Establishes Service on 44-Mile Route and Recovers a Daily Average of 500 Through Passengers—No Co-ordination with Rail Service

THROUGH bus service between Boston and Worcester was begun June 1 by the Boston & Worcester Street Railway. In some respects this adoption of service is unique. It is not supplementary to nor co-ordinated with the electric rail service, which has been and still is in operation by the same company. The route followed by the buses covers for the most part a distinctly separate territory, that adjoining the so-called "The Yellow One Trail," known locally as the Weston Road, passing the historic Wayside Inn and thence leading through Marlboro, Northboro and Shrewsbury to Worcester. Thus the company operates a service for passenger travel quite independent of existing rights of way, and in so doing has extended its field of service.

Secondly, this railway becomes the exclusive through passenger carrier between Boston and Worcester by means of buses. The ruling of the Massachusetts Department of Public Utilities has acknowledged to this company rights of priority in service and by such act has eliminated competition by independent bus operators who for more than a year have contested for the growing passenger travel between these two cities.

Establishment of motor bus service by this company is of interest for another reason also. Whereas it has been a not uncommon practice to substitute buses for electric cars, with the subsequent abandonment of tracks, in this case the procedure has been different. It is the intention to continue rail service over the regular line and to rehabilitate to an efficient standard both rolling stock and track. Justification for this plan is found in the growing revenue from an increasing electric freight service, a not inconsiderable proportion of the total income now derived by this company, as told in *ELECTRIC RAILWAY JOURNAL*, Nov. 5, 1925.

During the past year careful study was made of methods for increasing revenue from passenger travel and decreasing the cost of operation. Experience gained in the operation of ten street car type buses on branch lines of this company, the Framingham-Marlboro-Hudson, Framingham-Saxonville and the Framingham-Framingham Center routes, on which electric cars were abandoned, has proved invaluable as a basis on which to consider motor bus service on other routes within the territory served. For the reconstruction of 12 miles of branch line track and efficient rolling stock

more than \$100,000 was estimated as a first and immediate cost; against this figure was set an outlay of \$70,000 for new buses to operate along thoroughfares adjoining the track lines. The decision in favor of bus operation on these branches has been fully justified.

The problem of through bus service on the main line, on the other hand, involved a number of different problems. The route for a considerable portion is double track and on the western, or Worcester, end is on a private right-of-way. The highway adjoining the main-

each of 25-passenger capacity, are leased to the Boston & Worcester Street Railway at the rate of 30 cents per vehicle-mile, of which 5 cents is charged to depreciation of equipment. Not only is the holding company responsible for providing adequate equipment but it also assumes the responsibility of furnishing well-trained, reliable drivers. Fourteen have been selected for this service. Costs of operation and repair are carefully checked at the offices of the Boston & Worcester Street Railway.

Inspection of motor buses is made at the expiration of each daily run. On arriving at the garage the driver reports his speedometer reading, and after recording the gasoline pump reading he fills his supply tank and records again the final pump reading. Calculations of gasoline consumption and mileage are later carried out by the office force. The bus is then inspected by the garage attendant and entries made on daily record cards for air pressure in each tire, hydrometer readings of each battery, amount of lubricating engine oil replaced and pounds of grease required for replenishment of cups and containers.

At the expiration of each 5,000-mile run a thorough overhauling of each bus is made and a complete record kept of the condition of the motor vehicle. This practice insures an accurate accounting for the condition of the buses in operation. Tire records are maintained for individual tires and a form is used separately for each brand. Whenever special repairs are required a record is kept of both kinds of work and the cost. These are entered on a card, of which there is one kept separately for each vehicle.

The company has commenced a survey of a number of factors affecting cost of operation of vehicles employed on the regular Boston-Worcester run. Outstanding as a condition affecting economy is the matter of proper lubrication, both amount and quality. To this end experiments are in process and these require engine oil tests in regular routine travel. Five gallons of a specified oil are placed in a clean engine; after a day's run under definite mileage this oil is drained and tested for solids, viscosity and flash. Using again the same engine cleaned, and under similar conditions of traffic and mileage, other oils are subjected to tests. It is expected after these tests have been carried on for a reasonable time that data will be obtained that can be used to arrive at a decision as to the most suitable engine oil under actual conditions of operation. Similarly tire wear is being studied. The fact that much of the highway on this route is concrete with little crown and that curves are frequent and at places quite sharp warrants close attention to these items of cost keeping.

AVERAGE DAILY REVENUE INCREASED \$750

At the end of the first month of operation the record of passenger traffic showed some interesting information. The average number of daily passenger rides for the month was 500; the peak load carried on holidays and Sundays reached more than 1,200. These figures multiplied by the trip rate, which is \$1.50 between Boston and Worcester, give an indication of an encouraging recovery of revenue. Conversely, they also show to what extent independent operators might well infringe on the returns of the company if such competition were allowed to continue unrestrained.

Under agreement with the Boston Elevated Railway,

Franklin T. Miller, Receiver of BOSTON & WORCESTER ST. RY. CO. BUS TIMETABLE

Between BOSTON, WORCESTER and Intermediate Points			
BOSTON to WORCESTER		WORCESTER to BOSTON	
	A.M.	P.M.	
Boston Lv.	8.30	9.30	11.00
Watertown	8.55	9.55	11.25
Waltham	9.00	10.00	11.30
Weston	9.15	10.15	11.45
Wayland	9.30	10.30	12.00
So. Sudbury	9.35	10.35	12.05
Marlboro	10.00	11.00	12.30
Northboro	10.15	11.15	12.45
Shrewsbury	10.30	11.30	1.00
Worcester Ar.	10.45	11.45	1.15

Franklin T. Miller, Receiver of Boston & Worcester St. Ry. Co.

BUS RATES from WORCESTER to

SO. SUDBURY	1.30
WAYLAND	1.30
WESTON	1.30
WALTHAM	1.30
WATERTOWN	1.50
BOSTON	1.50

Beautifully appointed
De Luxe Buses
Careful and Courteous Operators
Legalized and Bonded
Bus Service

Franklin T. Miller, Receiver of Boston & Worcester St. Ry. Co.

BUS RATES from BOSTON or WATERTOWN to

WESTON	\$.90
WAYLAND	.90
SO. SUDBURY	.90
MARLBORO	.90
NORTHBORO	1.50
SHREWSBURY	1.50
WORCESTER	1.50

Beautifully appointed
De Luxe Buses
Careful and Courteous Operators
Legalized and Bonded
Bus Service

Rate Cards and Timetables Distributed by Railway

line track throughout the eastern end is not, at the present time, the popular route from Boston to Worcester, nor is the condition of the road surface such that heavy bus traffic can be maintained as satisfactorily so far as time and safety are concerned as is the case on the well-known and widely used route through Weston and Sudbury. Thus there was practically only one motor bus route available between the two cities, and on this, though outside its immediate territory, the Boston & Worcester Street Railway has been granted licenses by the municipalities served and a certificate for operation by the Massachusetts Board of Public Utilities.

These permits are issued to the Weston Transportation Company, a subsidiary company acting as holding company and from which the Boston & Worcester Street Railway leases equipment for the purpose of carrying passengers over the route. Such a procedure became necessary in order that the new routes might be established and also because this direct through line could be more advantageously managed as an independent unit.

Under agreement, seven de luxe type Mack buses,

the Middlesex & Boston Street Railway and the Worcester Consolidated Street Railway the buses operated by the Boston & Worcester Street Railway do not accept passengers within zones of these former companies for local stops. On the other hand, through passengers are accepted, with fares so arranged as to avoid encroachment on territorial rights of local operating companies.

Rate cards and time-tables are distributed by the Boston & Worcester Street Railway to acquaint its passengers with schedules and fares. A terminal has been established at Park Square, Boston. Here passengers can secure hourly service to Worcester on a scheduled time of 2½ hours. In order to accommodate theatergoers who desire to attend Boston theaters special late buses, held until some time after the starter has received announcement by phone from the principal theaters that the last curtain has been rung down, wait for the convenience of the public. This feature of accommodation alone has added much to the popularization of motor bus travel over the route recently opened for operation by this company.

New Cars Make Money on Fitkin Properties

Purchase of Modern Equipment for Altoona, Scranton and Youngstown Popularizes the Introduction of One-Man Operation—Passengers and Employees Welcome Improved Facilities

FURTHER proof as to the efficacy of light-weight cars in reducing operating costs has been obtained by the results on three railways under Fitkin management. In November and December of last year the Youngstown & Suburban Railway, the Scranton Railway and the Altoona & Logan Valley Electric Railway received a number of new cars, designed for one-man or two-man operation and built by the Osgood-Bradley Car Company. These cars were identical in construction for the three railways, but have been subjected to somewhat dissimilar operating conditions.

In Scranton, Pa., prior to the receipt of the ten new

cars obtained under this order, one-man operation had never been attempted. With the new equipment it was introduced. Now, in addition, the company has 29 P-A-Y-E cars which have been remodeled for one-man operation. The ten new units replace old-style cars with longitudinal seats and of much heavier construction.

One-man operation had previously been adopted by the Altoona and Youngstown companies, but a number of refinements of design and operation were effected with the Osgood-Bradley cars. The thirteen new cars ordered for Altoona replaced a number of old and obsolete single-truck wooden cars and two heavy double-truck units of wood construction. Favorable comments have been received from patrons of the line with regard to the improved riding comfort and appearance of the light-weight cars.

The cars for the Youngstown & Suburban Railway now run between Youngstown and Leetonia, a distance of 19½ miles. It was not thought advisable to place them in interurban operation during the height of the holiday rush and they were accordingly limbered up in local service, where light-weight one-man cars had been in operation for a number of years. The older interurban units, which were replaced, were unsatisfactory for a change-over to one-man operation. The new cars in Scranton and Altoona are used principally for local service and are giving excellent performances as well as meeting with considerable popularity.

Considerable interest centers on the interurban operation of the new cars by the Youngstown company. Schedules, ordinarily presumed to be slowed up by one-man operation, have been maintained even better than with the two-man cars. The company states that the one-man operators are thoroughly sold on the new type of operation and would be loath to return to the two-man system. While the cars have not been in service long enough to make possible a definite statement as to the reductions which will be effected in maintenance of equipment, the company believes that 1 cent per mile is a conservative estimate of the savings which will be possible. The scheduled speed of the new units is the same as that of the old, while a reduction in energy consumption from 3.1 kw.-hr. to 2.1 kw.-hr. per



Exterior View of One of the Youngstown Cars. This Car Is Exactly Similar to Those in Use in Scranton and Altoona

car-mile has been made. Total platform wages have been reduced from \$1.10 per hour to 60 cents per hour. This allows for an increase of 5-cents per hour for one-man operators.

Considerable thought and study were necessary in determining the method of fare collection to be used with one-man interurban operation. It was desired to adopt a system which could be readily checked and still would not be a burden on either passengers or operators. The Macdonald ticket box for cash fare receipts was chosen to care for passengers paying cash. It was further determined to encourage the use of tickets and commutation rates by the daily rider, and ten-ride

Attention Patrons!

Soon after January 1, 1926, new cars will be placed in service between Youngstown and Leetonia. These cars are of the most modern type, low, light, sanitary, one-man operated and equipped with all known safety devices.

With the inauguration of this new equipment certain changes will be necessary in the method of fare collection. We are adopting the method now working very satisfactorily on a number of interurban lines, as same is, we believe, one that will meet the approval of our patrons and account for passengers carried.

On all through cars fares will be collected on a pay as you enter basis; all passengers boarding at stations will be asked to purchase tickets. These tickets will be punched by operator as passengers board car, ticket thus punched will be returned to passenger by operator and will serve as an indication of fare paid. ON LEAVING CAR PLEASE RETURN THIS CANCELLED TICKET TO OPERATOR.

In case of passengers boarding en route and tending cash fare operator will issue cash receipt for fare paid. THIS CASH FARE RECEIPT PASSENGER WILL PLEASE RETURN TO OPERATOR UNFOLDED AS YOU LEAVE THE CAR.

On local cars operating between Youngstown and Lowell Avenue and Youngstown and Boardman no change in the present method of fare collection will be made.

Your co-operation will be appreciated.

THE YOUNGSTOWN & SUBURBAN
RAILWAY COMPANY.
E. O. SHRYOCK, Manager.

Card Given to Patrons of the Youngstown & Suburban Railway Prior to the Adoption of One-Man Operation

family tickets were provided for those not riding frequently enough to warrant the purchase of commutation books.

Signs were placed in all agencies requesting passengers to purchase tickets before boarding cars. A week previous to placing the new cars in through service the change in methods was well advertised by car cards and station signs. In addition, all passengers were presented with cards giving full instructions concerning the methods to be used in collecting fares under the new service. A reproduction of one of these cards appears herewith. So carefully were the instructions read and digested by the patrons that company officials state it would have been practically impossible for a stranger riding over the line on the day the change was made to become cognizant of the fact that a complete metamorphosis of methods had been made. One hundred per cent one-man operation is now in vogue over the company's lines, with the exception, of course, of the freight work.

In Scranton fewer schedule failures have been experienced since the introduction of one-man service. The company believes that this improvement may be attributed to the fact that with one-man operation the responsibility is placed upon a single individual and that this man appreciates the greater import of his job, is more alert and performs his work better. With two-

man operation, on the other hand, the men are inclined to divide the blame for schedule failures and accidents. One-man operators are paid 8 cents over the maximum two-man wage, or 72 cents per hour. This high wage rate was the result of an arbitration on the 1925 contract, the award being made by Thomas J. Williams of the Department of Labor.

Operation in Altoona during the peak load in the morning is front-entrance, pay-as-you-enter and exit both doors. This method is employed for approximately two hours each day, due to the number of men who must be transported to the Pennsylvania Railroad shops. During the balance of the day the operation is rear entrance, front exit and pay-as-you-leave.

The 27 new cars in use on the three railway properties are fully equipped with safety devices and have the following specifications:

Builder of car body...Osgood-Bradley	Gears and pinions.....Nuttall
Type of car..One-man, double-end	Hand brakes...Peacock staffless
Seating capacity .....44	Heater equipment...Consolidated Car Heating Co.
Weight, car body.....35,000 lb.	Headlights....Ohio Brass, Gold Ray; Electric Service Supplies
Bolster centers, length.....21 ft. 4 1/2 in.	Journal boxes .....Symington
Length over all....41 ft. 10 in.	Lightning arresters..Aluminum cell
Truck wheelbase.....5 ft. 6 in.	Motors....Four Westinghouse 510-A, 2,600 volt
Width over all.....8 ft. 4 1/2 in.	Safety devices .....Safety Car Devices Co.
Height, rail to trolley base....11 ft. 1 1/2 in.	Sanders...Osgood-Bradley traps
Body .....All steel	Sash fixtures....O. M. Edwards
Interior trim .....Cherry	Seats .....Heywood-Wakefield reversible
Headlining .....Agasote	Seating material.....Leather
Roof .....Arch	Step treads.....Kass safety
Air brakes .....Westinghouse	Trolley retrievers .....Knutson
Axles .....Pollak heat treated	Trolley base .....Ohio Brass
Car signal system....Faraday buzzers	Trolley wheels.....Ohio Brass
Compressor..Westhouse DH-20	Trucks .....Osgood-Bradley 45-66-FE
Control....Westinghouse K-35	Ventilators .....Eight Garland C-1 fr. type
Curtain fixtures...Morton Mfg. Co. pinch handle	Wheels .....26 in. diameter
Curtain material ....Pantasote	
Destination signs .....Hunter illuminated	
Finish..Pratt & Lambert enamel	

Tramways Operate One-Third of All Buses in France

CO-ORDINATION of rail and bus service is making steady progress in France. According to the latest French governmental reports approximately 4,500 buses of all kinds are now in operation. Of this number about 1,500 are run by the various tramways, some 2,000 are used in regular intercity service and 1,000 more are in special service, such as sightseeing, touring, etc.

By far the largest single tramway bus operator is the Société des Transports en Commun de la Région Parisienne, with 1,368 such vehicles on Aug. 1, 1926. Classified according to types these were:

	Aug. 1, 1926	Aug. 1, 1925
Four-wheel buses.....	1,265	1,263
Six-wheel buses.....	51	51
Express buses.....	30	28
Sightseeing buses.....	22	22
Total.....	1,368	1,364

Passengers carried by the buses of the Société des Transports en Commun de la Région Parisienne increased steadily from 1921 to 1924. In 1925 the fare was raised and some loss of traffic resulted. Figures for the various years follow:

1921.....	245,902,430
1922.....	290,146,147
1923.....	337,503,838
1924.....	356,529,851
1925.....	344,800,583

Melbourne Tramways Bolster Up City's Finances

Strenuous Efforts Being Made to Safeguard the Goose Which Lays the Golden Eggs—Mr. Strangward Points Out Why It Is Necessary to Increase Tramway Fares in the Australian Metropolis

By W. O. Strangward

Secretary Melbourne & Metropolitan Tramways Board

EDITOR'S NOTE

This article is based on a recent radio talk made by Mr. Strangward in Melbourne. It presents that portion of his remarks which indicates the peculiar tax situation that has been allowed to grow up. It is scarcely conceivable that such conditions can exist in a modern, progressive city. The Melbourne Tramways are supporting even the sick, the halt and the blind. Conditions in some parts of the United States are sufficiently bad, but it is to be doubted if they can approximate the *mélange* which is Melbourne.

HERE are some facts which cause tramway fares to be very much higher than they would otherwise be. Although we are expected to run the trams upon business lines and to make each year's revenue balance the expenditure, we are compelled by act of Parliament or by time-honored custom to meet expenditure out of tram fares which cannot be justified upon commercial principles and most of which would not be paid by a tramway management if it were privately owned. Of course this expenditure is not waste or a loss to the community, because if we did not pay it some one else would have to do so.

TRAMWAYS ARE FORCED INTO THE RÔLE OF PUBLIC BENEFACITOR

The first item to which I refer is a sum of about £28,000 per annum which the state government used to contribute to the Queen Victoria Infectious Diseases Hospital. No one can urge that the tramways should be responsible for a proportion of the upkeep of an infectious diseases hospital, yet since 1919 an act of Parliament has compelled the Tramways Board to relieve the state of this burden. It is now paid out of tramway fares.

Then a sum of £53,000 per annum is required to supplement the contributions of the Councils and the insurance companies so that the Metropolitan Fire Brigade, of which we are so justly proud, may continue to protect the people's properties from destruction by fire. The Tramways Board pays this, although it is difficult for any one to see why tramway passengers, as such, should contribute to the upkeep of the Fire Brigade.

ANOTHER CHANCE TO STING THE TRAMWAYS BOARD

Some of you may remember that long before there were any tramways in Melbourne an alteration was made in the method of collecting license fees for public houses. This alteration deprived the local Councils of the publicans' license fees, which up to that date they

were accustomed to collect. The government, however, decided to pay to the Councils a sum equivalent to what they were deprived of. This now amounts to £23,000 per annum. In 1919 an act of Parliament shifted the payment from the government onto tramway passenger fares, and we have paid it every year since that date. As the Mikado would have said, "It's a fool of an act, but still, that is what the act says!"

Now these three items alone cost the Tramways Board £104,000 per annum. The payment is a loss to us, but of course if we were not compelled to pay it the government would have to raise your income tax, or land tax, or some other tax, to a similar extent.

THE OLD STORY OF THE PAVING CHARGES

I could continue for quite a while quoting payments made by the board which save an equivalent expenditure by some one else. For example, we know that the railway finances have to bear the cost of making and maintaining the railway tracks. The Tramways Board also pays for the construction and maintenance of its tracks. There is this difference, however. No one, other than the railway department, has any right to use the railroads, but any one, even the motor buses, which would like to entice our tramway passengers away from us, can freely use the tramway tracks. As a matter of fact, our tramcars do hardly any damage to the roads which we make, because the tram wheels run only on the tram rails. Most of the damage to our tracks is done by ordinary vehicles. Just consider for one moment the immense value of the tram tracks to the people and the immense amount we save the municipalities every year.

We have constructed about 130 miles of the highest class of road, an average of 19 ft. in width, and we also maintain it in a condition which generally is much superior to the sides of the road, which are under the care of the Councils. You all know that our portion of the street is usually the best-kept portion of the road; the Councils see to that and promptly phone us if, as occasionally occurs, a rut temporarily escapes the notice of our track inspectors. Sometimes the Councils complain of the condition of our portion of the road at a time when the sides of the road are in a most deplorable condition, and we have to see that the complaints receive prompt attention. In many of the outer suburbs drivers of ordinary vehicles refuse altogether to run on the sides of the roads, and our tram drivers are sometimes compelled almost to stop before such vehicles will allow the tram to pass. If no tramways had been constructed the Councils would have been com-

pelled to spend about £1,500,000 in making the central portion of these roads, and the interest and sinking fund on this expenditure would cost the ratepayers about £100,000 per annum. The Councils would also be required to maintain the roads and would thus be involved in an annual expenditure of £250,000 per annum. I leave you to estimate what increase in municipal rates would be involved. In America the ratepayers are commencing to relieve the tramway companies of this burden, as they recognize its injustice.

TRAMWAYS ARE FAIR GAME FOR MUNICIPAL TAXES

I don't want to pick out every large item which tends to increase tramway fares, but it is worth while remembering that although the board up to last month was carrying the public at slightly less than cost price, it is compelled to pay the Councils about £13,000 per annum in municipal rates upon the portion of the road which, as I have just told you, was constructed and maintained by the board. Of course, we pay rates on our depots and other buildings as well; no one complains of that.

EVEN HAVE TO LIGHT THE STREETS

Are you aware that the board pays for the street lighting of 80 miles of suburban streets which are used by our trams? This costs us about £10,000 per annum. If there were no trams this expenditure would have to be met by the Councils out of your rates. I do not know of any other tramway undertaking in the world which pays for the lighting of the streets.

I will just mention one other item. I refer to the enormous amount of free traveling which the board is practically compelled by public opinion to grant. For example, we carry all members of the police force, while in uniform, free. Then the board runs a large number of so-called "workmen's" cable tramcars, upon which any one may travel at concession rates at practically half fare. Then we give passes to hundreds of blind people which entitle them to unlimited free travel. If the blind person is a returned soldier we also allow his attendant to travel free. We issue about 500,000 free passes per annum to returned soldiers whose war injuries seriously impair their means of locomotion. Scholars attending school are carried at rates which are about one-fourth of the adult fare and thousands of concession tickets are issued to school children visiting the sea baths, dental clinics, etc. It is estimated that these concessions, for which we receive no refund, are worth at least £30,000 per annum.

AT ANY RATE THE GOVERNMENT SAVES MONEY

The items I have mentioned represent an expenditure by the board amounting to a community value of at least £400,000 per annum. In other words, they are a loss to us, but the government, the Councils or the people thereby save that sum per annum. British and American tramway men who have visited Melbourne tell us that they have never heard of a tramway management which is subjected to such huge and unreasonable public burdens.

When the Church Street bridge was erected a few years ago Parliament ordered the board to pay £20,000 toward its cost. The Spencer Street Bridge Commission has recommended Parliament to direct the board to pay £80,000 toward the cost of constructing a bridge over the Yarra at Spencer Street. These payments must

eventually be paid out of tramway fares, yet the board's passengers only use the bridges in the same way as passengers in motor cars or motor buses use them. Payments of this nature render increases in tramway fares inevitable.

HAD TO OPEN NEW TRACK EVEN THOUGH TRAFFIC FAILED TO JUSTIFY IT

Since the board was appointed, seven years ago, we have opened more than 50 track-miles of new tramways. Not one of these new tramways (desirable as they are from the standpoint of public convenience) is yet able to meet its operating expenses and its proportion of the charges imposed upon the board by act of Parliament.

On some lines the passengers are not charged much more than half of what it costs to carry them. But these new tramways open up the comparatively cheap lands of the metropolis; the value of the land is greatly increased, the public is provided with a good road at the board's expense and the Councils are able to raise big rates from the properties. These new tramways are a good thing for the metropolis, but they all help to cause an increase in tramway fares.

The Trolley Car the Safest Vehicle on the Street

MUCH has been published about the small amount of street area per passenger taken by the electric railway car as compared with other means of transportation in the city streets. Not so much has been said about the relative safety of the various means of transport, but probably in most cities just as good a case for safety to passengers and pedestrians could be made out for the street car as in economy of street area occupied.

Some instructive figures of this kind have recently been compiled in Berlin, Germany, for accidents reported in 1925. Here it was found that, on the basis of passenger trips, the street car was 50 times as safe as

RATIO OF BERLIN STREET ACCIDENTS CLASSIFIED BY VEHICLE CAUSING ACCIDENT

	1925			
	Private Passenger Automobile	Taxi	Motor Bus	Street Car
Accidents, total.....	58	26	2.77	1
Persons injured.....	25	12	2.2	1
Persons killed.....	29	24.5	6	1
Accidents for which operator was responsible.....	103.6	53	4.4	1

the private automobile, and that on the basis of responsibility for accidents caused it was 100 times as safe. Necessarily, rather broad assumptions had to be made as to the number of passenger trips made daily in private automobiles and taxis in Berlin by the author of the compilation, Doctor Wentzel, professor in the Technische Hochschule in Aachen. But on the bases assumed, and taking the figure of the street car in each case as unity, the proportions work out about as shown in the accompanying table. The table appears in the issue for July 2 of *Verkehrstechnik*.

Corresponding figures for a number of the cities in this country would be of interest.

Application of Automatically Controlled Equipment to Substations

Complete Control Sequence of Substation Apparatus Is Necessary from the Time a Unit Receives Its Initial Starting Impulse Till It Is Taken Out of Service—Various Forms of Supervisory Control Systems Meet Requirements

By R. E. Powers

General Engineering Department, Westinghouse Electric & Manufacturing Company

SELF-STARTING synchronous converters and motor-generators with automatic switching have now become used quite generally in railway substations. Relays have been developed to indicate at all times the electrical and mechanical condition of the conversion unit and its associated switching equipment. Relays function to initiate the impulse that automatically starts the converter or motor-generator set when the voltage of the trolley circuit indicates the necessity for the capacity of the idle unit. Specific relays continuously check the supply line electrically, to determine the value of the voltage, the phase rotation and single or unbalanced phase conditions. Deviations from normal, within predetermined limits, will prevent an idle machine from starting and will take an active machine out of service until suitable line conditions are again restored.

In the case of the converter, synchronous speed and polarity are indicated by the action of a polarized relay, which functions to complete a portion of the sequence of operation when the polarity builds up in the correct direction. Should the polarity build up in the wrong direction, this relay closes certain auxiliary contacts that reverse the shunt field circuit momentarily, causing the converter to slip a pole and correct the polarity. Thermal relays that indicate the temperature of the bearings, windings and load limiting grids close their contacts when the temperature approaches a limit at which it is dangerous to operate the equipment. The closing of the thermal relay contacts shut the unit down temporarily if the grids or windings overheat, and permanently should a bearing overheat. Relays that indicate overload, overspeed, reverse current, etc., are constantly in attendance, checking the conditions under which the equipment operates, so that they may function to protect the equipment if a dangerous operating condition is indicated.

Automatic switching equipment has reached a stage in its development where the automatically controlled substation is considered superior to the manually controlled station. The tendency in railway practice is toward the installation of a larger number of small substations equipped with full automatic control. These can be located at the load centers, thus establishing a more uniform system voltage, eliminating long and costly feeder systems, mitigating the effect of electrolysis and securing the benefits and savings effected by automatic operation of the various elements of conversion equipment.

Every effort is being made to establish continuous service. Duplicate conversion equipment is placed in

important substations so that a spare unit is always ready to be put on the line in case the operating, or "lead off," unit is automatically taken out of service by one of its protective devices. In order to increase the reliability of the high-tension supply it is recommended in such cases that duplicate transmission lines, each capable of carrying the substation load, be supplied from the same or independent power sources. The switching equipment should be so designed that an

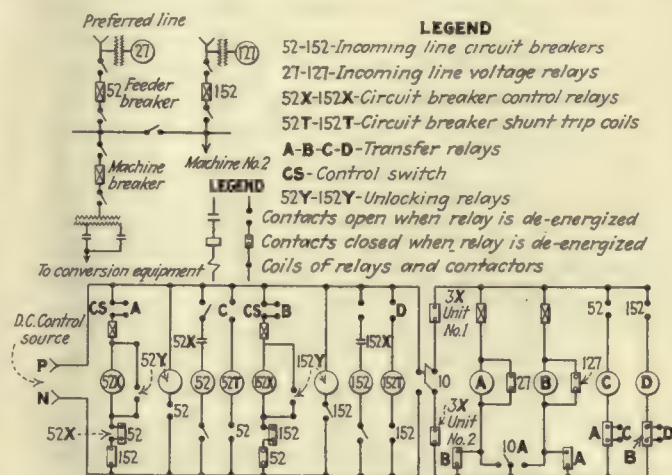


Fig. 1—Sequence of Operation to Automatically Transfer from the Preferred to Emergency Feeder System

automatic transfer from the preferred to the emergency feeder system is effected upon failure of the preferred feeder.

A typical scheme of rapid transfer from the preferred to the auxiliary source of power in case the preferred source fails is shown in Fig. 1. This shows the relays, contactors, and breakers in the de-energized position. A single-pole, double-throw switch 10A is used to select the preferred source of supply. With the double-pole switch 10 in the closed position, connecting the transfer relays A, B, C and D to the control potential, and knife switch 10A thrown to select breaker No. 52 as the connecting link to the preferred source of power, the sequence of operation is as follows:

Relays A and B will attempt to pick up, but the auxiliary contacts of relay A will open to prevent relay B from closing. A second set of contacts on relay A, which are closed when relay A is closed, will complete a circuit to the closing coil of relay 52X. Upon the closing of the main contacts of 52X the circuit to the closing coil of breaker 52 is completed, thus closing the breaker and latching it in. Auxiliary contacts on breaker 52 close when the breaker is closed and en-

energize the unlocking coil on relay 52X. This relay will cut off current from the closing coil of breaker 52 and from its own circuit, thus leaving the feeder breaker mechanically latched. The main busbars are now energized from the preferred source of power through breaker 52.

If the machines are operating and the incoming line through circuit breaker 52 fails, the machines in the station will be disconnected immediately from the alternating-current and direct-current ends by the action of the reverse current relays. Upon opening of the auxiliary master relay 3X of the machine automatic switching equipment, the transfer scheme becomes operative as follows:

Low voltage relay 27 being de-energized will close its contacts and de-energize relay A, thus causing relay B and C to close. Relay C will energize the shunt trip coil 52T to trip out feeder breaker 52. The opening of breaker 52 will complete a circuit through 152X to close breaker 152, as described above. The sequence of operation to retransfer from breaker 152 to breaker 52 can easily be checked by following the circuits in the sketch.

The automatic switching equipment controlling the machine is so designed that the rotating equipment may not be reconnected to the station alternating-current bus until the induced voltage due to rotation has been reduced to a low value. In order to decrease the normal time element of the induced voltage due to rotation, a block of high resistance is automatically inserted in the field circuit during the closing down period. This will effectively kill the field, and rapidly reduce the voltage to a minimum so that the equipment may be restarted without loss of time. Upon reduction of the induced voltage the automatic features of the switching equipment function to reconnect the units to the station bus and restore service with the minimum outage.

SELECTION OF CONVERSION EQUIPMENT

It is difficult to make a general statement as to whether motor-generator sets or synchronous converters should be installed in a given railway substation or system without first making a complete study of the conditions under which the equipment is to operate. Certain situations are ideal for synchronous converters while others indicate clearly that motor-generator sets would be more efficient and reliable. Motor-generator sets should be used at the ends of long transmission lines where the voltage is subject to sudden fluctuations, such as result from switching operations or sudden shifting of large blocks of power. If the resistance of the transmission line is excessive the operation of synchronous equipment in general will not be satisfactory.

On voltages of 13,200 or lower, the comparison between converters and motor-generator sets must be made on the basis of converters with their step-down transformers as units. On voltages above 13,200 the motor-generator set must be supplied with a step-down transformer, which gives a decided advantage to the converter in the items of over-all efficiency, space requirements and weight. In smaller sizes, however, up to and including 1,500 kw. at 13,200 volts, the installations of synchronous converters with automatic switching equipment are about on a par with the installations of automatically controlled motor-generator sets. With the transformers on the same floor level there is little

difference in space required. There is little difference in first cost for equipment in capacities of 1,000 to 1,500 kw. The over-all efficiency is in favor of the converter.

PROTECTION OF CONVERSION AND FEEDER EQUIPMENT

On large 60-cycle converters, approximately seven times full load will cause the rotor to drop back and pull out of step if the load is not removed in a sufficiently short period of time. Obviously the pull-out will occur at much lower load values as the alternating-current voltage is lowered. A synchronous commutator-type machine cannot slip a pole, under operating conditions, without serious flashing. To prevent flashing under the above conditions a quick-acting circuit breaker must operate to relieve the converter of its excessive load before it can drop back to its "pull-out" position. If the resistance of the short circuit path, including the converter windings, is such as to limit the current to less than this value, high-speed circuit breaker protection is not required. Such equipment or resistance is necessary with any arrangement of the converter if interruption to service from short circuit is to be prevented. In general, the same reasoning applies to motor-generator installation except that the motor-generator is inherently more stable and the commutating limits are not so narrow. Slipping of poles in the synchronous motor does not inherently cause a flash on the generator commutator.

When the feeder network is of such low resistance that the short-circuit current will exceed the commutating capacity of the generator, high-speed circuit-breaker or flash suppressor protection is necessary.

In order to secure a quick-acting direct-current breaker capable of opening or limiting the current in such a case, a radical departure from standard breaker design is necessary. Fig. 2 is a schematic diagram showing the arrangement of levers, pivots, springs and solenoids, incorporated in the latest designed high-speed direct-current breaker.

In the open position with all electrical parts de-energized, the opening and closing springs hold the main floating member solidly against stops, causing the plunger to be drawn out of the closing solenoid. When potential is impressed on the closing circuit, the closing plunger is drawn into the solenoid, causing motion of the closing lever around the fixed pivot A. By the action of the closing lever the main floating lever is rotated around the upper stop as a center, causing the closing spring to be distended and the sealing armature to come into contact with the magnetic circuit of the holding-in coil. Potential is now applied to the holding-in magnetic circuit. The sealing of the armature makes the pivot D a fixed point. Thus when potential is taken from the closing coil the closing spring rotates the floating member around pivot D as a center to close the breaker and place the opening spring in tension as shown in an accompanying illustration.

Standard carbon circuit breakers open in from 0.1 to 0.2 second, while a high-speed breaker, to be of any value in preventing flashovers, must open the circuit in the incredibly short period of time required for a synchronous converter to drop back in phase position sufficiently to fall out of step or for the commutator of a motor-generator set to become sufficiently heated to cause vaporization of the copper and the establishment of an arc between brushes of opposite polarity.

A description of the improved type of Westinghouse high-speed circuit breaker was published in the *ELECTRIC RAILWAY JOURNAL* for May 29, 1926, on pages 935 and 936.

In the oscillogram shown a direct short circuit was thrown on a 2,000-kw. 1,500-volt synchronous motor-generator set by closing a quick-acting knife switch. Sufficient cable to connect into the circuit the high-speed breaker shunting current-limiting resistance constituted the only external resistance at the time the short was applied. The breaker functioned to limit the short-circuit current to 12,500 amp. in 0.009 second. Complete opening of the breaker and rupture of the arc in 0.017 second inserted the current-limiting resistance to reduce the current to 4,810 amp. The average rate of rise of the short-circuit current during the first 0.009 second was at the rate of 1,400,000 amp. per second.

Direct-current feeder breakers equipped with short-circuit detector relays and service-restoring features, in combination with a high-speed breaker in the machine circuit, make a very flexible type of feeder and machine protective equipment. This type of feeder equipment utilizes the ordinary electrically operated circuit breaker provided with the short-circuit detector relays and automatic reclosing equipment. The circuit breaker is mechanically latched when closed and is tripped by an "impulse coil," which is in reality a through-type current transformer, the feeder circuit being the primary.

The short-circuit detector relay is operated from the induced secondary current of this impulse coil or current transformer. The amount of current induced in the secondary of the impulse coil depends entirely on the rate at which the current is changing in the feeder circuit. The rate of rise of direct-current short circuits depends on the character of the short and the distance from the station bus. A short circuit of trolley to rail just outside the substation constitutes practically a terminal short circuit, and the rate of current rise will be of the order of 3,000,000 amp. per second, depending upon the machine characteristics. Short circuits between the third rail and track, at an appreciable distance from the substation, have been recorded in which the current rise was of the order of 500,000 amp. per second. Under such conditions appreciable current is induced in the impulse coil secondary, causing the breaker to be tripped. Under normal conditions or conditions of slowly changing loads the rate of current change is so small that the induced secondary current is negligible and the breaker is not opened. Therefore,

due to its design features, the breaker selects between short circuit the overload, opening only on short circuit.

In situations where an appreciable amount of current may be dropped suddenly, as might occur by the sudden interruption of the current required to accelerate a large eight or ten-car train, the short circuit detector relays are provided with auxiliary windings excited from the station bus when the feeder breaker is in the closed position. The flux set up by this bias winding is in such a direction as to neutralize the flux set

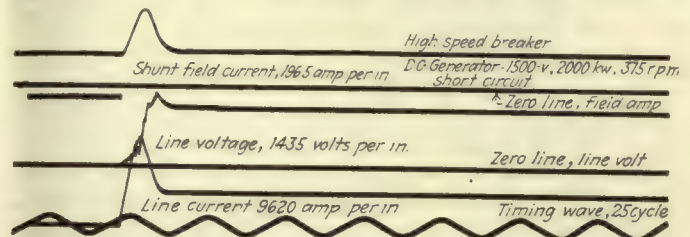


Fig. 3—Oscillogram Showing Voltage and Current Values in the External Circuit of a 2,000-Kw., 1,500-Volt D. C. Synchronous Motor-Generator Set. Type HS Direct-Current Breaker Functioned to Limit the Short-Circuit Current and to Insert Current-Limiting Resistance Between the Terminals of the Generator

up in the detector circuit due to a rapidly decreasing load current. Therefore the detector relay will not operate to open the feeder breaker on rapidly decreasing values of load current.

Fig. 4 shows a single-line diagram of a two-unit automatic substation equipped with a high-speed circuit breaker in the machine circuit, and short-circuit detector service restoring feeder breakers in each of the three feeder circuits.

A short occurring on any of the feeder circuits, through independent means, will trip the high-speed circuit breaker in the machine circuit and the carbon breaker in the feeder circuit. Due to its high-speed characteristics the machine breaker will open first and insert a resistance in the machine circuit to limit the short-circuit current to a value within the commutating limits of the conversion equipment. The feeder breaker, being slower in action, opening on the order of 0.2 second, will then function to open the feeder circuit, disconnecting the conversion equipment from the fault.

As soon as the short-circuit condition has been relieved by the opening of the feeder breaker, the high-speed breaker, through the action of automatic switching equipment, will reclose to establish full bus potential. The feeder breaker is equipped with resistance measuring relays that function automatically to reclose the feeder breaker when the resistance of the

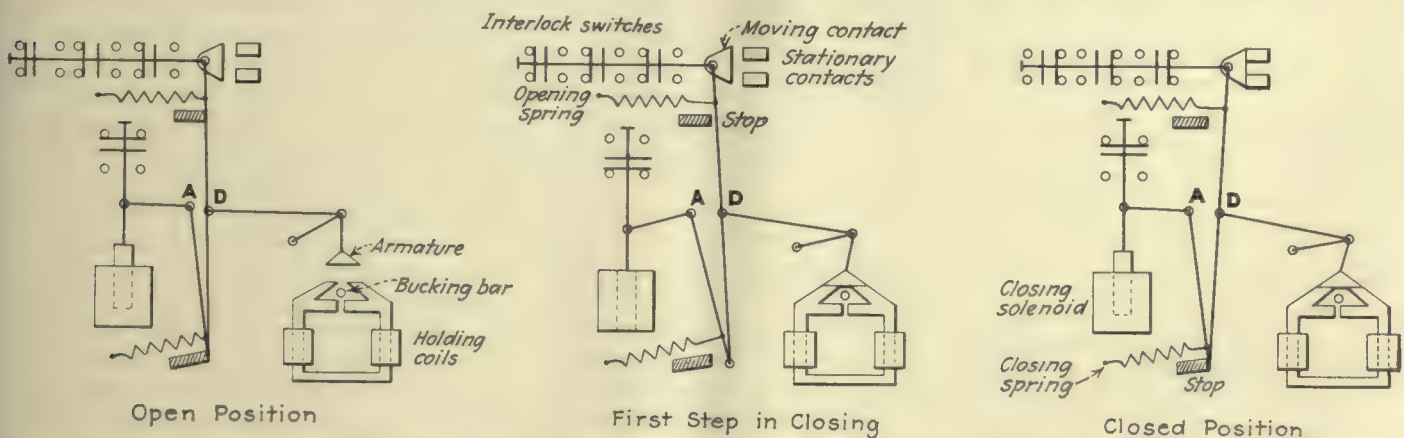


Fig. 2—Single-Line Diagram Showing Pivots, Levers, Solenoids, Springs, etc., Incorporated in the Latest Designed High-Speed Direct-Current Circuit Breaker

external circuit is such that the breaker may be safely closed in.

Under legitimate overload conditions, such as often occur from congestion in the downtown district during the rush hour, the feeder breaker and high-speed breaker will remain closed and load will be shifted from the overloaded station by automatically inserting load-shifting resistance between the machine terminals and the bus, thus allowing adjacent stations to pick up the

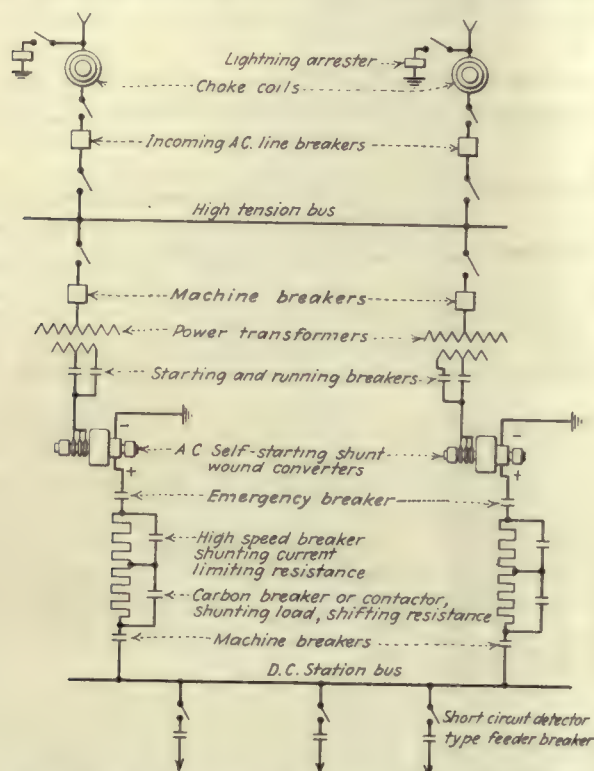


Fig. 4—Two-Unit Automatic Substation Equipped with Shunt-Wound Rotary Converters, High-Speed Breaker Shunting Current Limiting Resistance in the Machine Circuits, Direct-Current Feeder Breakers Equipped with Short Circuit Detector Relays and Automatic Reclosing Features

overload. The feeder breaker is of the "latched in" type and remains closed regardless of the bus voltage. Overload protection on the feeders may be secured by thermostats mounted on the feeder itself. The thermostats allow taking advantage of short time-overload capacity of the feeder, tripping the breaker only when the copper reaches a predetermined temperature.

The application of automatic switching equipment to units in the various substations of railway systems made necessary the development of a new form of communication between the load dispatcher and the substation. This was done so that the automatic operation of the various units in the stations could be under control, that knowledge of their operation and load condition could be transmitted automatically from the non-attended station to the dispatcher whose function is to control and co-ordinate the operation of the system substations, thus securing the most efficient operation under normal conditions and the most beneficial and reliable under conditions of system disturbances.

Various forms of supervisory systems, each with its field of application, have been developed to meet the requirements of different types of automatic electrifications. The Westinghouse synchronous all-relay type of supervisory control uses the principle of step by step synchronous selection. In this type of control a minimum of four wires are used between the dispatcher's office and the substation to be controlled, over which

the rotating equipment may be started, stopped or locked out, feeder breakers may be opened or closed, station bus or feeders sectionalized, readings of the station instruments may be transmitted—in fact, any operation may be performed that is usually carried on by the operation of an attended station.

By means of two of the lines and a simple synchronous control circuit, signaling relays in the dispatcher's office and the substation are kept in step and moved from point to point in a definite sequence. The remaining two wires are switched by the step by step action of the synchronous selector circuit from one control and supervisory point to another. Thus when any operation is to be performed a clear metallic circuit is established between the control in the dispatcher's cabinet and the desired apparatus unit to be operated.

The dispatcher's control keys and supervisory signaling lamps are connected to a set of selecting relays while the apparatus units at the substation are connected to a similar set. The selecting relays operate in absolute synchronism at every step or not at all.

Should the dispatcher wish to actuate any mechanism in a distant substation, he operates a key associated with the apparatus unit desired, and then a start key. Signaling relays in the dispatcher's office and distant substation pull up in regular sequence with both equipments in exact synchronism until the required key is reached. The two signaling wires are thus connected to the station battery, through the key associated with the apparatus unit, in the dispatcher's office. Operating current passes from the battery through the operating key circuit and associated selector relay to the signaling wires. At the substation the current flows from the signaling circuit through its associated selector to the desired apparatus unit to initiate the required impulse automatically to perform a given co-operation. This impulse is not in the form of a code and is usually obtained by a contact of the interposing relay making an electrical connection to initiate some automatic operation, such as energizing the master relay of the automatic switching equipment in order to start and connect a rotary converter to the station bus, or to energize the closing motor or solenoid of a circuit breaker from the station bus or battery in such a manner that the breaker will be closed automatically. After an operation has been completed, auxiliary contacts on the apparatus unit transmit the signal back through the same signaling relays and circuits to operate the indicating lamps at the dispatcher's office. The signaling relays are released by the action of the proper answer back or signaling circuit, indicating that the correct operation has been performed. The relays then continue to step up in synchronism until all signaling relays have been pulled up and released, thus completing the chain of operation.

When an operation occurs in the distant station such as opening of a breaker, stopping of a unit due to one of its protective devices, etc., the selecting relay action is effected rapidly and the signaling wires are switched from position to position. When the wires connect the apparatus unit, that has changed its position, to the corresponding signaling equipment at the dispatcher's office the indicating lamps are changed to show the operation that has taken place. The equipment comes to rest immediately after the sequence of operations has been completed, therefore insuring long life of equipment and minimum service from the battery, as

control energy is used only during the period that the equipment is in operation. There is no counting of impulses, checking back of circuits, or totalizing of impulses to perform an operation. The selecting relays in the dispatcher's and substation equipment operate in absolute synchronism to assign the signaling wires in a definite sequence to the points of control until the desired point of control is reached. The sequence is then stopped until the desired operation has been performed and correct visual answer back received, thus releasing the relays and allowing the chain of operation to continue until all relays have been pulled up and the sequence completed.

The signaling circuit of two wires, which are switched by the signaling relays, provides a clear metallic circuit which may be used for selective remote metering in conjunction with its use for control and supervision of apparatus units. Indications of any character may be secured, such as volts, amperes, watts, power factor, reactive volt-amperes, etc., or any desired indication of electrical or mechanical condition that can be made to operate the remote metering sender. Stop keys associated with each signaling point permit reading any one of the indications for as long a time as desired.

The continued installation of automatic switching equipment in the substations of various railway systems having d.c. trolley voltage from 600 to 3,000 indicates that automatic operation is here to stay and that it is playing a very important part in our railway electrifications.

The most efficient and reliable method of substation operation may be secured by the automatization of the various substation units and the co-ordination of their operation by supervisory control in order that the system as a whole may be operated as a unit. Automatic equipment performs, without error or waste of time, and eliminates the human factor from the switching operations. Automatic operation of substation equipment insures reliability of operation, full protection to equipment, minimum delay in service restoration and economic operation of substation equipment.

Street Cars Advertise Milwaukee

SIGNS teaching safety lessons and to encourage street car riding are displayed on the cars of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. While brevity is essential on signs of this nature, the messages cover a fairly wide range of interesting and helpful suggestions. Here are some examples:

The motorman is doing his part to avoid accidents. Are you?
We appreciate your patronage. Ride again.
Flashing red lights mark street car crossings.
Golf! Go by street car.
Think before you cross ahead of this car.
Ride with us and save the difference.
Progress and street cars go hand in hand.
Your parking problems solved. Ride with us.
Visit the zoo at Washington Park. Take street car.
Play tennis? Take the street car.

Some of these signs have already been used and a new message is to be broadcast each week.

In addition to the dash signs, the company has cards inside the cars. One that has drawn much favorable attention bore the message: "Thank you! Ride with us again. Use the street car and save the difference." In this card the words "Thank you!" just seemed to pop out of the picture, as if they were spoken.

New Freight House Built at Akron

CONSTRUCTION of a new freight house costing \$80,000 has just been completed by the Northern Ohio Power & Light Company at Akron. The new structure is located just east of the old freight house, which will be utilized by the company's line department and for the storage of electrical supplies. The building is of brick and steel construction, 256 ft. long and 45 ft. wide. The front 48 ft. is used for offices and is two stories in height. In that section is housed the freight auditing department, which has been moved there from the company's Terminal building.

Plans for the building were drawn by J. P. Colwell of the Commonwealth Power Corporation, who supervised the construction. The freight room proper is 204x45 ft. of clear space. Rail tracks are on the west side, with a 45-ft. concrete team loading drive on the



Double Rail Tracks Give Loading Facilities for Ten Cars in Addition to Space for Through Freight Trains at New Akron Freight House of Northern Ohio Power & Light Company

east side. Double-rail tracks give loading facilities for ten cars in addition to the space provided for through freight trains. The freight room is equipped with the latest type of scales located on the driveway side so that freight may be taken from trucks, weighed and handled through the freight room car loading platform or direct into the cars as desired. A portable office is provided in the main room for the warehouse foreman.

Foundations of the building are of concrete throughout, having a basement under the office portion. The walls are brick with steel roof trusses. On each side of the freight house there are twelve of the latest type rolling steel doors. These are counterbalanced so that they may be raised by one man with little exertion. Doors are located opposite each other on both sides, giving a through route for trucking freight. The floor is of 3-in. planking painted with a hardening liquid which is intended to give long wear without splintering. A 7-ft. platform along the west side is completely sheltered. Special provisions for handling oil at the extreme north end of the building are being provided.

The new house is of fireproof construction throughout, there being little woodwork except the main freight room floor. Stairways are of steel with safety treads. The wall between the office and freight room is so constructed as to prevent fire spreading.

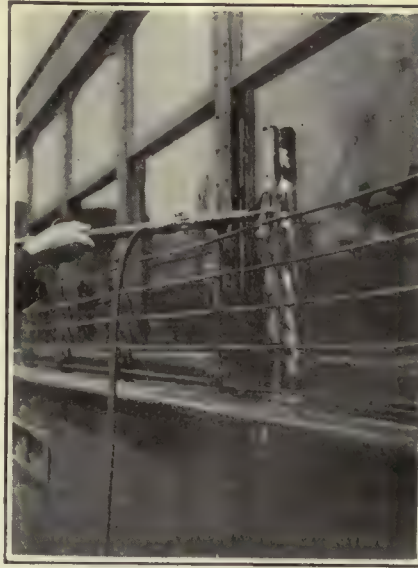
The system of lighting installed is completely modern and is planned to give uniform light on all parts of the working area. The type of unit selected was the Standard RLM Benox type. In the warehouse proper bowl enamel lamps are installed.

Maintenance Notes

Cars Showered and Scrubbed While You Wait

"HAVE you had your morning shower?" would no longer be an uncommon question could we but know the language of cars. Recent experiments of the Pittsburgh Railways have added to the morning's ablutions an automatic scrubbing process that bids fair to make the modern carhouse take on the aspects of a college dormitory twenty minutes before class time.

The accompanying illustrations show several views of an experimental equipment erected in one of the carhouse yards. This consists first of a shower a car length ahead of the scrubber that thoroughly wets the sides of the car. After this first wetting the windows are washed by means of a hydraulic wiper uniquely designed to slip between the glass of the lower sash and the window guards, thus avoiding the tedious task of unfastening and later replacing these guards. The wiper face consists of a piece of brussels carpet bolted around the surface. Several streams of water are forced through small jets from an attached hose. The whole arrange-



Hydraulic Window Washer Designed by Pittsburgh Railways

The washer fits between the lower glass and the window guards. This device avoids the task of unlatching the guards and re-fastening them in place after the windows are washed.

ment is handled by the operator and the windows are cleaned with dispatch.

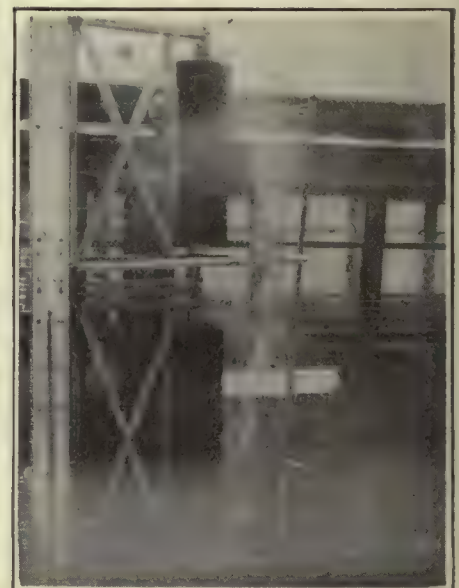
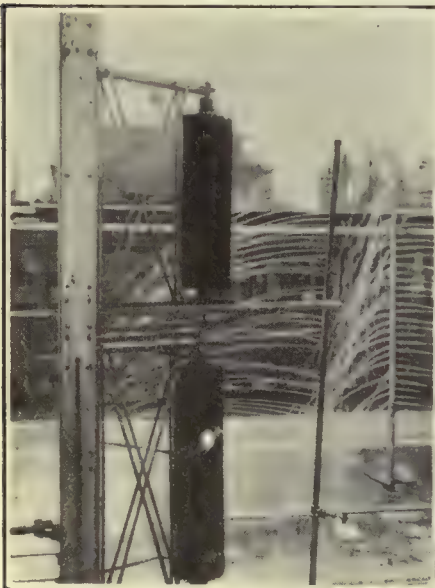
The car then wet, with the dust and dirt well soaked, passes rapidly revolving brushes that are mounted vertically and suspended on a spring

arrangement so as to hold the brushes firmly to the car sides. As the car passes through, the remaining dirt is flushed off by the spray at the sides of the brushes and the car comes out as clean or cleaner than if washed by hand.

There is no lack of water in the scrubbing process and the car looks like an airdale pup emerging from a pond. The actual amount of water used is not great, however, as the car passes through the scrubber at a speed obtained by having the controller about on one notch and the water is shut off as soon as the car passes.

Fairly soft bristles are used in the brushes so that no damage is done the paint surface. They are stiff enough, however, to remove the grime that so soon collects on the car surface. The bristles are also long enough to reach between and below moldings, rivet heads, etc. Since this company has adopted the lacquer system of paint there are no resultant scratches from the rapidly-revolving brushes.

So far only experimental equipment has been built for cleaning one side of the cars so as to try out this arrangement carefully. If the com-



Many Jets of Water and Soft Revolving Brushes Perform the Work of Several Men

At the left is shown the trial equipment that scrubs the car sides. Here the shower is running but the brushes are not revolving to illustrate the method of drive. A small 500-volt motor erected to the side in a watertight compartment is bevel geared to a vertical shaft, which in turn revolves the

brushes by means of a chain drive. The brushes, mounted on long arms, have springs that hold them against the car sides. The whole structure is supported on a vertical I-beam set in concrete.

In the middle view the car is about to enter the scrubber and the shower. The

device was built for one side only. Until a second unit is installed the opposite side is cleaned by hand.

The view at the right shows the car half way through the scrubber, proceeding on one notch of power. Only a few seconds is consumed in the process.

pany decides to adopt this plan a corresponding set of brushes will be erected on the opposite side of the work track and the entire arrangement will be inclosed or placed within a carhouse so that it may be used equally well in winter weather.

Experiments are also being conducted to see if a brush can be developed that will wash the windows behind the guards and thus avoid this hand operation. Also, plans are being developed for automatically scrubbing the car ends which now must be done with hand brushes.

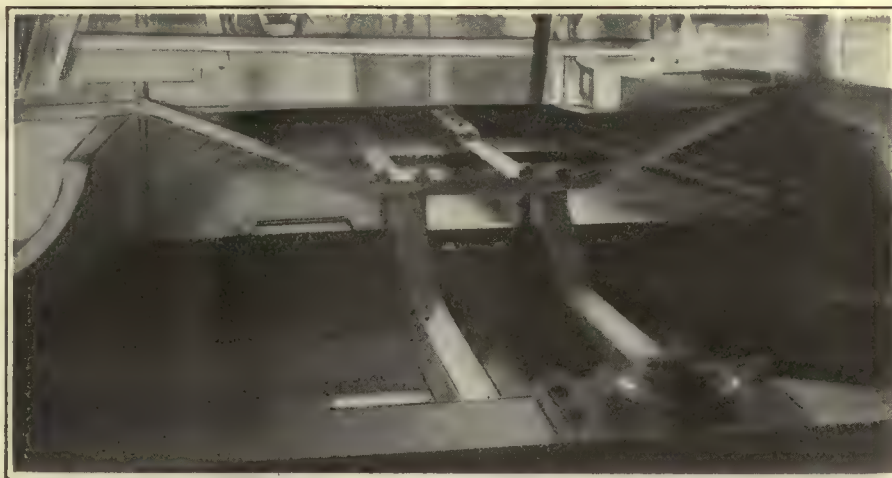
If this device can be perfected it will be an easy matter to run each car through the shower and scrubber every day by the crew that first takes the car out on a run.

Protection for Journals Prevents Damage

FOR saving of space in the storage of wheels when mounted on their axles, it is common practice to have one pair of wheels set with respect to the adjacent pair so that the faces will roll by until the flanges of the wheels come in contact with the axles. If particular care is not used when placing the mounted wheels in position, there is danger that the flanges of one pair of wheels will damage the journal bearings of the adjacent pair. To provide a protection for the journals while handling, transporting on shop cars and in storage, the Department of Street Railways, Detroit, Mich., uses a special covering for the journals.



A Special Fixture Placed Around the Journal Prevents Damage from the Flanges of Adjacent Wheels



A Shaped 3-In. Channel Is Used to Strengthen Long Platform Supports on Certain Wheeling Cars. The Firm Anchor to the Center Sections Add Great Stiffness to the Side Members. Drooping Platforms on These Cars Are Thus Avoided

The covering consists of a $\frac{1}{8}$ -in. steel shell lined with $\frac{1}{2}$ -in. felt. The shell is made in two parts, hinged along one side while the other is provided with a catch and hasp so that the covering can be held firmly in position. This arrangement provides a covering that can be quickly attached and which is very effective in preventing damage.

Platform Knees Stiffened on Wheeling Cars

CHANNELS of 3-in. section bent to a form shown in the accompanying illustration are used under certain cars of the Wheeling Traction Company, Wheeling, W. Va., to prevent platform sagging. A few cars on this property have long platforms that are supported on long members shaped to slope together toward the

front. A slight bump tends to bend these supports inwardly, which in turn tends to cause the platforms to sag.

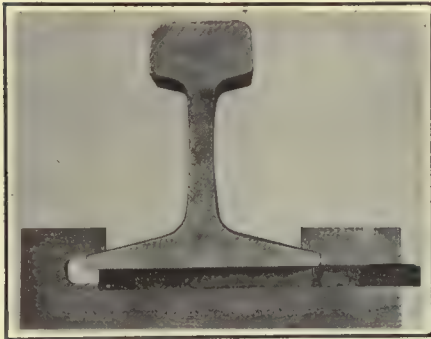
To overcome this trouble the 3-in. channel was cut and shaped and applied in the manner shown. The side members were first spread apart to the normal position by jacks, and while under this pressure the channel was bolted tightly in place. By this means sagging platforms on these cars has been cured and the car is considerably stronger should other bumps occur.

New Equipment Available

Rail Anchor Fits Any Standard Tee Rail

PROVISION for sufficient adjustment to fit rails in any condition and an original design which prevents the two parts of the anchor from being separated are outstanding features of the "Bethco" rail anchor, just put on the market by the Bethlehem Steel Company, Bethlehem, Pa.

While the anchor is of two-piece construction, it is shipped and installed as one piece. The two pieces can be separated only with considerable difficulty and by a very unusual manipulation of the parts. This two-piece construction allows sufficient adjustability to take care of more than one rail section, over or undersize rails, and the increasing tendency of rails to wear thin where they rest on the tie plates or because of corrosion.



Section Showing How New Anchor Is Applied to a Rail

The anchor consists of a heavy flat yoke which hooks over the base of the rail on both ends and a heavy key which is driven horizontally between the base of the rail and the yoke. This key provides the wedging action to hold the rail in place and can only be removed in a similar manner to the way it is installed. Since there is no force acting upon the key in this direction it will not become loosened while in service. The wedging action of the key is crosswise of the rail, along practically the entire base of the rail. This fact and the channel shape of the key prevent in from being forced sidewise off the yoke.

The working forces are exerted against the anchor at right angles to the yoke and key. The deep, broad surface of the yoke, along its entire length, bears against the surface of the tie, distributing the pressure over a large area, avoiding damage or destruction to the tie after it is in place.

The installation of the anchor is extremely simple. The yoke is hooked over the base of the rail and the key is driven home by means of a hammer, rail chisel or other handy tool. No special tools are required. Since the key cannot be dislodged



Rail Anchor After Installation

except by driving, no further attention is required until renewal of the ties or other work makes the removal of the anchor necessary. Slippage of the rail through the anchor can only be accomplished by practically destroying it.

The anchor meets all the specifications of the A.R.E.A. requirements for rail anchors or anti-creepers.

The Bethlehem Steel Company is being assisted in the introduction of this device by Geo. L. Moore, former engineer of maintenance Lehigh Valley Railroad and chairman of the A.R.E.A. rail committee.

Carefully Balanced Torch Makes Handling Easy

CUTTING operations of all kinds on metals up to 3-in. section are taken care of by a light but rugged combination welding and cutting torch designated as Rego KW



New Type Cutting and Welding Torch

Medium, which has recently been brought out by the Bastian-Blessing Company, Chicago, Ill.

An assortment of three cutting tips, furnished with each torch, gives ample range for the different classes of work. Three welding tips KWW 37, 48 and 62, illustrated here, will be furnished at extra cost, if specified. Length of the tool is 10 in. and weight 34 oz.

This device, using oxygen and medium pressure acetylene, is said to be so well balanced and easy to handle that by simply changing tips it can be used for making welds up to 1-in. section.

Improved Shape for Mesh of Step Treads

BY GIVING an elongated S curve to the reticuline bar a mesh or opening has been created that is a distinct improvement in step tread construction by the Irving Iron Works, Long Island City, N. Y. With the new mesh there is less opportunity for dirt to collect and painting is facilitated, light diffusion is improved and the long double sweep of the bend makes a better traction surface. The combination of straight

and curved lines also gives a more pleasing flooring pattern.

With 7-in. rivet centers this new flooring is known as type M and with 3½-in. rivet centers as type O. Other distinctive Irving features of alternate deep and shallow bars are retained.

One-Gallon Extinguisher for Electric Cars

GREATER capacity than the usual quart size fire extinguisher was found desirable by the New York Westchester & Boston Railway for the size of fire extinguisher to be carried on its cars. As a result, this road has now adopted the Phister 1-gal. carbon tetrachloride fire extinguisher. Another advantage is that it can be pumped up to the desired pressure and kept in this condition ready for use, while with the smaller sizes of other types it is

necessary to continue the pumping action while the liquid is being exhausted. With the larger size there is no danger of exhausting

the supply of liquid before the fire is extinguished. The cost of this extinguisher, as stated by officials of the railway, is about three times that of the type previously used, but its greater capacity is thought to warrant the increased price.



One-Gallon Carbon Tetrachloride Fire Extinguisher

The extinguisher is recharged by unscrewing the filler cap and filling with carbon tetrachloride solution. The gage at top insures pumping to required pressure and maintaining it.

Association News & Discussions

Insurance Regulations for Cars and Carhouses*

Excerpts from the Latest Underwriters' Rules Are Given, with Comments on the Way that Some of Them Were Reached

BY JAMES S. MAHAN

President, Western Section, International Association of Electrical Inspectors

THE present regulations of the National Board of Fire Underwriters for electric railway carhouses and cars is the final outcome of some twelve or fifteen years of rather intensive work by a number of fire insurance engineers having to do principally with public utility properties.

In working out this standard the lessons learned from numerous traction property fires have been considered from all angles, with the idea in view of lessening fire insurance losses on traction property buildings and rolling stock as much as possible. Traction companies may deviate as far as they care to from this standard, but compensation will have to be made in the fire insurance rate; in other words, a property which follows this standard to the letter will receive a minimum insurance rate.

BUILDING CONSTRUCTION

Carhouses should be one story in height, without basement or closed roof spaces. The outside and division walls should not be over 25 ft. in height at the eaves, nor more than 30 ft. at the peak of the roof. Where, on account of the nature of the surroundings, it is absolutely necessary to build carhouses more than one story in height, wall dimensions are given in the tabulation in the standard. This standard, you will find, requires the walls to be of hard burned brick, stone or reinforced concrete of a specified thickness. These types of wall materials have been found to stand up better than tile under severe exposure to fire. Steel skeleton work in the walls does not lessen the required thickness of a wall proper.

Where traction property buildings are near other risks which may expose them to fire from outside sources, it is necessary to parapet the walls, or in other words carry the wall at least 3 ft. above the eaves where the roof is of a combustible material. If the roof, as well as the walls, is of concrete or other such material parapets are not necessary. Walls dividing the risk into fire sections shall be parapeted the same as outside walls and all division walls should project at least 8 in. beyond the outer edge of the cornice. All walls should be provided with a durable incombustible coping.

*Abstract of paper presented at meeting of Electric Railway Association of Equipment Men, Southern Properties, Chattanooga, Tenn., July 28-30, 1926.

One of the big contributing factors to the extensiveness of traction fires is the communication of fire from one section to another. To prevent such conditions the standard requires that only one opening, not exceeding 38 sq.ft., may be made in each 100 ft. of wall length. These openings must be protected on each side of the wall by standard automatic fire doors. To control the conflagration feature as much as possible, the floor area of any one section of a carhouse has been limited to 20,000 sq.ft.

Skylights and ventilators are an important feature in the prevention of the spread of fire in traction properties. These devices shall have metal frames and sash, with the frames and other parts riveted or otherwise securely fastened in addition to soldering. They should be glazed with wire glass, or plain glass may be used if protected above with stout copper or galvanized wire screens with mesh not larger than 1 in.

Brick, concrete, stones, cinders, earth or other incombustible material is recommended for floors. However, treated wooden blocks may be used when placed on a concrete base.

Car pits may either communicate or be separate units under each track. Under no circumstances shall they connect under more than four track sections. Pit walls shall be constructed of the same material as other building walls.

Arrangement of the tracks is another important feature in keeping down losses through fires. All tracks should run clear to the street without break or transfer table, and preferably should communicate to the outside at both ends of the building.

Track doors shall be of a type which will readily open in case of an emergency, preferably of the vertical roller type covering not more than two tracks, or they shall be swinging doors made in pairs and opening outward. Certain types of sliding doors should not be used; neither should doors opening in pairs.

All chimneys and stacks shall be of solid masonry, standard construction.

BUILDING WIRING

Suitable wood troughs should be provided above all trolley wire in the risk. For rigidity of construction it is recommended that T-iron or T-copper be used. Trolley wires, as well as T-con-

ductors, shall have a conductivity of not less than No. 0, B. & S. gage wire. All hangers and supports of trolley conductors shall be spaced so that in case of a break at one of the supports the trolley conductor would not come in contact with the rail.

Where it is necessary to break the continuity of the trolley wire, as at track doors, the wire shall be equipped with suitable sectional insulators. In order to be able to disconnect all trolley wires inside of buildings or yards, line insulators shall be installed with a feed around the insulators controlled by an emergency switch, this switch to deaden all trolley wires leading into the building and within 50 ft. of the building. Feed wire to the building or yards shall be of ample carrying capacity, but not less than No. 0, B. & S. gage. Rails forming the return circuit of a grounded trolley system shall be bonded at joints with not less than No. 0, B. & S. gage copper conductors. Current collectors of all types shall be removed from contact with trolley wires when cars are not in use.

CARHOUSE MAINTENANCE

Standard carhouse lighting shall be by electricity.

Heat shall be by steam, hot water, hot air or electricity, with all piping well supported and free from woodwork. Boiler and furnaces shall be located in a separate fire section, preferably outside of the main building with all openings into the main building protected by approved automatic fire doors.

A good supply of standard self-closing metal waste cans shall be provided for all oily waste and trash, and should be emptied daily. Approved watchman service shall be installed, with stations well distributed throughout the premises, rounds to be made not less than hourly.

Carhouses proper shall be used only for storage and cleaning of cars and for inspection and replacement of minor parts and minor repairs. General repair work should be in a separate fire section. Premises shall be kept entirely clear of accumulations of trash and rubbish. The use of sawdust and shavings to absorb oil and grease drip-page should not be permitted, sand being much preferable.

Smoking shall be prohibited in sections devoted to car storage, with prominent "No Smoking" signs posted throughout the premises.

WIRING AND ELECTRICAL EQUIPMENT OF CARS

Lighting circuits for cars may be operated upon potential not exceeding 750 volts maximum. All circuit appliances shall be approved for a nominal rating of 600 volts. For higher voltages not to exceed 1,500 volts, lighting circuits shall be run in grounded rigid

conduit with all circuit appliances approved for voltage.

When the circuit has a grounded return conductor, the capacity of the return conductor shall be equal to that of the conductors in the non-grounded side, or shall be adequate for the combined load of all circuits connected to it. Joints in ground wires shall be as required for joints in circuit wires. Ground wires shall terminate in a permanent ground connection to the car driving motors or trucks. It is permissible to run ground conductors bare, except where exposed to contact with unauthorized persons. This does not prohibit the use of the metal members of the car as a ground return for auxiliary circuits.

All conductors shall be stranded and shall have a rubber insulation. Their minimum size is to be as follows:

		Minimum Size
Passenger signal circuits.....	No. 18	B.&S. gage—1,624 circ.mil
Lighting circuits.....	No. 14	B.&S. gage—4,107 circ.mil
Auxiliary motors and devices.....	No. 14	B.&S. gage—4,107 circ.mil
Heating circuits.....	No. 12	B.&S. gage—6,530 circ.mil
Motive power circuits.....	No. 6	B.&S. gage—26,250 circ.mil

In compiling this standard an effort has been made to establish one with a workable basis. In this connection three methods of wiring cars have been provided, leaving it to the choice of the operating company to select whichever it prefers.

Either rigid metal conduits with cable boxes or approved flame-retarding, moisture-repelling non-metallic ducts or cables with approved rubber insulation protected by approved flame-retarding and moisture-repelling outer coverings may be used.

All conductors except those run in rigid metal conduit or cable boxes must be so concealed or isolated that contact cannot be made accidentally with them by unauthorized persons.

Non-metallic ducts and the outer coverings of wires and cables must be constructed to resist mechanical injury. Such cables or ducts must be securely fastened into the cases with approved clamps, to be supported by non-conducting cleats or straps. They must be run in continuous lengths from box to box or from outlet to outlet, unless made-up cables are used, with joints and end caps covered with approved flame-retarding moisture-repelling coverings equivalent to those on the cables themselves.

Provision is also made for trolley leads on car roofs to be raised so as to permit suitable drainage under them. Conductors subject to abrasion through car sills or in other locations must be protected by short lengths of metal conduit with ends bushed. All conductors with inclosures must be kept well away from direct wheel wash, and where this is not possible should be provided with non-corrodible fenders or guards to protect them against such wheel wash.

Wooden cable boxes can be used only on the interior of the car and should be made of not less than 5-in. wood lined with 1/2-in. asbestos lumber or similar material. They must be provided with suitable fittings.

All car driving power circuits must

be protected by a main automatic circuit breaker located either in the cab or on outside of the car, with a reset control in the cab.

Circuits for other than car driving must be supplied ahead of the main circuit breaker and be provided with suitable fuse and switch protection close to the point of connection.

All switches, cutouts, circuit breakers, etc., having exposed live metal parts, must be inclosed in approved cabinets and be well guarded to prevent passengers or other unauthorized persons from coming into contact with the live parts. Headlight frames must not be used as conductors. Portable headlights must be wired for double plug connection. All plug connections must be so wired that the female end will be attached to the source of energy. (A new device just

heater expansion tanks, whistle pipes, etc., must either be grounded or insulated. The insulated joints must be located immediately below the car roof. All fuel-burning heaters located inside the car must be well grounded.

Wires connected to different sources of energy must not be cabled together or run in the same duct except in the case of jumper cables between cars.

Resistors must be mounted with ample air space between resistor grids and car body, with heat-resisting barriers of at least 1/4-in. fire-resistive insulating material, or sheet metal not less than 0.04-in. in thickness mounted above the resistance and extending sufficiently beyond the resistor supports.

Resistor grids must be thoroughly insulated from resistor frames, and the frames also insulated from supports. The insulation on the conductor to the resistors must be removed at least 6 in. from their terminals. The bared conductor must be filled with solder to make it rigid at the point of connection.

Electric heaters shall be of approved type for use in railway cars. By "approved type" is meant shall bear the Underwriters' Laboratories' label. Branch heater circuits shall be protected by fuses of no greater rated capacity than the normal heater current per circuit. The fuse capacity should be as follows:

Between 0 and 7 amp.....	10 Amp.
Over 7 and to 10 amp.....	15 Amp.
Over 10 and to 15 amp.....	20 Amp.
Over 15 and to 20 amp.....	25 Amp.

In this connection it may be of interest to give you a little of the history of this standard. The old standard for car heaters was one of installation; there was considerable discussion as to whether the standard should continue to be one of installation or should be one of performance.

Certain members of the committee insisted that the heater with its inclosing case be treated as a complete unit. The Underwriters' Laboratories and a representative of the Chicago Surface Lines very kindly offered to assist the committee in this connection. All of the heater manufacturers were invited to submit samples of their product for a heat run test to determine which type of installation should be considered as a standard.

The electrical engineer of the Underwriters' Laboratories, using the same temperature limit as is used on numerous other heat devices, set a temperature limit of 90 deg. C. (194 deg. F.) as the maximum temperature to any combustible matter adjacent to the heater (speaking of the heater case and all as a unit). The tests on the heaters submitted were run on regular car seats supplied by a traction company.

It was found that heaters could be manufactured which would be operated successfully below this maximum temperature. The sub-committee having this subject in charge then dictated the standard as it now stands in Sections 20 and 21 of the regulations of the National Board of Fire Underwriters. Later all of the heater manufacturers were invited to attend a conference on

COMING MEETINGS OF *Electric Railway and Allied Associations*

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

November 16-19—American Welding Society, fall meeting and International Welding and Cutting Exposition, Buffalo, New York.

the subject of the labeling of car heaters by the Underwriters' Laboratories. At this meeting it was definitely decided by them to subscribe to Underwriters' Laboratories' label service, designating that their heaters have been tested by the Laboratories and approved by them.

Wisconsin Utilities Association Studies Ways to Improve Public Relations

MORE than 100 delegates and friends assembled on Aug. 12 at La Crosse, Wis., for the two-day session of the Electric Railway Section of the Wisconsin Utilities Association. Many of the talks made at this meeting discussed the establishment of better public relations. An important note was sounded by C. R. Phenicie, vice-president Wisconsin Public Service Corporation, Green Bay, who said that any

attempts of this kind must not be too obvious.

Chairman Nels C. Rasmussen, superintendent railway department, Wisconsin Valley Electric Company, Wausau, estimated the present value of Wisconsin electric railway properties at more than \$67,000,000.

A forward-looking report on the subject of noise prevention has been developed by the Wisconsin association. Kent Wooldrudge, fellowship student at the University of Wisconsin, has devised a machine to measure a reverse direction. The noise is picked up in a standard loud speaker, then converted into an electric current which is greatly amplified and read on a milliammeter. Great possibilities are seen in the development of this machine and its application to the problem of noise reduction on electric railways.

Abstracts of papers and a full report of the meeting will appear in the next issue of ELECTRIC RAILWAY JOURNAL.

Shop Records and Their Value*

By A. TAURMAN

Superintendent of Equipment and Way and Structures,
Birmingham Electric Company, Birmingham, Ala.

FOR the proper and economical maintenance of cars and equipment it is necessary that we have adequate records, which should be kept in the simplest form and properly tied in with the records of the auditor and transportation departments, so when taken as a whole they will give a complete record of our activities.

Assuming that the proper records are available as to the type of equipment, date purchased and the manufacture thereof, the auditing department should furnish the shops with the accurate mileage of the individual cars which is obtained daily from the transportation department. This mileage is entered in a loose-leaf binder under the individual car numbers. A simple form is to add the mileage each day to that previously made, so that by simple subtraction the total mileage made between any two dates may be found.

Proper forms should be provided for the inspection, maintenance and complaint reports. Inspection and maintenance should be handled on a mileage basis and the blank forms should not only indicate the various parts of the equipment receiving attention but the workman's name and the dates on which the inspection and repairs are made.

The form for complaints should show the car number and various parts of the car with date and by whom the complaints are made and corrected. These forms should be filed by the car numbers and dates so that they may be easily referred to.

DATES ARE IMPORTANT

In the overhauling and repairing of equipment the dates on which they are made, class of material used and cost of labor should be kept. This is to ascertain if we are using the proper class of material and that the labor costs are not excessive.

*Abstract of paper presented at meeting of the Electric Railway Association of Equipment Men, Southern Properties, Chattanooga, Tenn., July 28-30, 1926.

When records are kept of the various parts of equipment, any weakness that develops or repeated failures will be called to our attention so that steps may be taken to remedy the defects. Where material is purchased under a guarantee, it is necessary that accurate records be kept as to its performance so the company may be reimbursed for the failure of the product to meet the manufacturer's guarantee.

A card index should be kept of all men employed, the date employed, their past record and present performance.

The shop should have access to the storeroom records of all material purchased, which should give the name of the manufacturer, cost, amount purchased and amount of each type used monthly.

Charts should be prepared showing cost of inspection, maintenance, number of failures, so that a comparison may be made with previous months and years.

Records should be kept of all buildings with their fire protection equipment and when repairs and inspection are made.

ACCURATE RECORDS WORTH THEIR COST

While the records outlined above appear at first glance to be expensive to keep, this is not the case when the proper system is put into effect. The inspection and maintenance of cars on a mileage basis insures that the equipment will receive attention at regular periods after certain service has been performed. The handling of complaints with the above system places responsibility for failures and insures that proper repairs will be made.

The keeping of records on material as to cost and life enables us to make the proper selection when it is purchased. This, in turn, assists in the proper and economical maintenance of our equipment.

Proper records in the equipment department not only help to prevent fail-

ures and accidents but materially assist the claim department in adjusting claims when accidents occur and make it possible for the transportation department to give adequate service to the public.

American Association News

Noise Reduction

A MEETING of the noise reduction committee of the American Electric Railway Association was held at Detroit Aug. 2, 1926. The meeting was attended by C. Bethel, motor engineering department, Westinghouse Electric & Manufacturing Company; Frank L. Hinman, assistant superintendent of rolling stock and bldgs. Philadelphia Rapid Transit Company, and H. S. Williams, assistant superintendent of equipment, Detroit.

During the year the committee has conducted a series of noise tests with apparatus built specially for this purpose as authorized by the A.E.R.A., the apparatus consisting of a noise pick-up device connected through radio amplification devices with a micro-ammeter giving definite readings, proportional to the amplitude of the noise vibrations. Tests were made on various track constructions and different types of gearing, in which the gears were tested independently of all other sounds.

The committee approved the method of testing and the preliminary tests. Further detailed tests are to be completed for submission with the committee's report to the Cleveland convention. It was decided to request of the association permission to exhibit the noise-measuring apparatus at Cleveland for the purpose of stimulating interest in the committee's work. Future work was discussed and tentative plans laid for further development of the noise reduction problem.

Metropolitan Section Plays at Pelham Bay

IN SPITE of a wide range of weather conditions, beginning with great heat and ending with deluges of rain, all the members of the Metropolitan Section, A.E.R.A., had a good time on their annual outing at Pelham Bay Park on Aug. 11. Golf, baseball, quoit pitching, tug of war and various other sports occupied the early part of the day. Rain in the afternoon caused an interruption to the baseball game between the railway men and the manufacturers. When the rain came the score was tied, but after the end of the storm the game was resumed, resulting in an overwhelming victory for the railway men. Golf enthusiasts were out early in the morning and played till 2 p.m. A new use for the bus was discovered in connection with the tug of war. After exhaustive pulling the supply men and the railway employees each won a heat. The third and final pull was won by the supply men through excellent co-operation with a near-by bus.

The News of the Industry

Union Organizers Leave Indianapolis

Indications that the International officials of the Amalgamated Association regard the strike of the employees of the Indianapolis Street Railway, Indianapolis, Ind., as lost is seen in the departure of four representatives of the organization from the city. L. D. Bland, national treasurer, and P. J. Shea, member of the general executive board, have returned to their homes in Detroit. Mr. Shea would make no comment on their departure. Mr. Bland, however, said the strikers still had the union's support morally. It was made clear some time before that the International would send no more strike benefits to the Indianapolis strikers. Officers at that time recommended that the strike be called off. Members of the striking local, however, refused to take such action.

John M. Parker and Robert B. Armstrong, vice-presidents of the Amalgamated, were released on bond by Judge Robert C. Baltzell in federal court in Indianapolis following the granting of an appeal of their conviction for contempt of court. Bonds were set at \$10,000 each. Parker and Armstrong, organizers of the Indianapolis local of the union, were found guilty of contempt of court a week prior and were remanded to jail until the appeal was filed. They were charged with violation of an injunction which prohibited them from counseling a strike, encouraging strikers or interfering with the operation of street cars.

Edgar Day, a striker, who appealed his conviction of contempt, also was released on a bond of \$5,000. Parker and Armstrong received sentences of 90 days in jail. It was announced by attorneys for the two men that the organizers would be withdrawn from Indianapolis by the national officers of the union. Jefferson Fade, another of the strikers, was released on his own recognizance after having been convicted of contempt.

Attendance of strikers at the daily meetings has fallen from about 500 to 100.

Wages Advanced in Memphis

An increase of 2½ cents an hour was awarded to Memphis Street Railway union employees by the board of arbitration in its decision announced on Aug. 6. The award is effective as of April 1 this year, and the accumulated wages held in abeyance pending decision of the arbitration will be paid by the company to the men on Aug. 21.

The increase raised the wages of the men from 45, 50 and 55 cents for one, two or three and more years of service to 47½, 52½ and 57½ cents for the respective periods of service.

Judge M. R. Patterson, Attorney

A. B. Galloway and L. P. Miles made the award, the first two voting for it, and Mr. Miles, representing the company, dissenting.

The new contract is effective for two years from April 1.

In an editorial on Aug. 8 the *Commercial Appeal* strongly commended the spirit of the men and the company in arbitrating the issue. It emphasized that public interest is always best served when men are sane and fair.

The editorial said in part:

The most friendly of relations between company and employees were maintained during the period of controversy. There were no criminations and recriminations. The conflict of views was the result of honest opinion, and each company of disputants showed for the other a consideration that was commendable.

Instead of a disrupted service while the questions was under consideration, regular schedules have not only been maintained, but the service has been improved. This improvement could not have been brought about except for the wholehearted co-operation of employers and employees.

Newark, Ohio, Without Railway Service

Unfortunate Situation Forced Upon Management by Activities of City Authorities Acting Against Wishes of People—Public Relations Good and Loyal Co-operation from Employees Gratifying

AS OF midnight, Tuesday, Aug. 10, the city of Newark, Ohio, is an all-bus town, operated by the newly created independents. For years railway operation has failed to pay expenses. Despite this, service has been maintained through two receiverships and after great effort and absorption of heavy losses a new franchise was granted by the city of Newark which became effective on Nov. 22, 1924. This ordinance relieved the company of certain paving, extended the franchise life for 25 years and allowed the company to charge a fare necessary to pay for the service. It fixed the fare for the first year. The franchise also carried a clause allowing the company to withdraw any portion or all of its rail or bus service if any competitive lines should be granted a permit to operate.

The granting of this franchise was one of the elements which enabled the company to reorganize and emerge from the second receivership. This it did as the Southern Ohio Public Service Company, which operates the light, power and railway in Zanesville, the railway in Newark, and the interurban line connecting Zanesville, Newark and Columbus.

As a part of the reorganization plans the company acquired control of all bus operations in Newark and has been giving the city of Newark a co-ordinated service of rail and bus even at a substantial loss after operating expenses for the combined operation. In accordance with the terms of the franchise, the company asked the Council for an increase in fare to 10 cents cash and four tickets for 25 cents. The Council took no action. After a period of three months the company further, in accordance with its franchise, announced that the new fare would become effective as of March 5, 1926, whereupon an injunction against the increase in fare was obtained, and before final disposition of the injunction proceedings the court declared a vacation.

Not satisfied with this, the Council, contrary to the spirit of the past two

years negotiations, has granted a competing franchise for an independent to give service paralleling all the company's rail and bus lines at a 10-cent cash fare and tickets at a reduced rate. Sixty days after this fare permit eight buses appeared on the street.

In view of the lack of faith shown by the Newark City Council and the extensive losses sustained by the company during the past several years the company decided to close down its entire local bus and rail service. On Aug. 9 the company had a meeting with its men and advised them of its intention. The company, however, allowed its men, thus thrown out of work, ten days' wages. On Tuesday night the company ran a full-page advertisement in the local papers outlining the series of events that led to its action and announcing the fact that the service would be discontinued as of that day.

The company's rate has been maintained through the injunction proceedings at a 6-cent cash fare with nine tickets for 50 cents.

The franchise granted by Newark City is similar to that passed by the city of Zanesville at a prior date. The greater faith of Zanesville has resulted in a high-grade co-ordinated bus and rail service in that city at the same fare asked in Newark. Zanesville is pleased with the service and the relations between the public, the Council and the company are excellent.

Council planned a special meeting following the announcement to abandon, but put off action. An indignation meeting of 600 could not be accommodated at the Chamber of Commerce headquarters and moved to the City-Hall. Citizens stormed independent buses. Sentiment is strong against the Council for granting the 5-cent bus franchise.

A notice of the company to the citizens of Newark, headed "What more can we do?" signed by R. Z. Zimmerman, vice-president and general manager, follows:

When the present management took over what is now the Southern Ohio Public

Service Company's property in Newark it set about to provide a modern and adequate transportation service, in order to render good public service.

With this plan in mind, it proceeded to lay the groundwork for what was believed would best suit the needs of the community.

Accordingly, your City Council was impetioned in order that suitable legislation might be enacted, whereby both the company and the city would be protected, and negotiations were carried on for nearly two years, resulting in the passage of Franchise Ordinance No. 3619.

This franchise contract placed upon the Southern Ohio Public Service Company the obligation of furnishing Newark with transportation facilities for a period of 25 years, and believing that the contract was made in good faith, the company proceeded to put into effect the plans prepared for a satisfactory transportation service.

There are few citizens who are not aware of the efforts made to rehabilitate the rolling stock and provide new buses—buses built in Newark, with Newark labor and materials—on both of which were spent large sums of money. As to whether our efforts in this direction were worth while, they who know must be the judges.

One of the vital clauses in the franchise ordinance provides for a fare regulation—upward or downward—as the circumstances warrant, and when it was found necessary to have an upward revision in order to permit the property to continue its usefulness, the city denied the privilege and court action ensued, which added to the burden under which the system was already staggering. Contrary to the intent of the existing franchise ordinance, the city administration encouraged and created competitive operation, allowing a cash rate of fare of 10 cents, which rate of fare was denied our company upon application. Not content with these actions, a bus regulating ordinance is now being considered by Council, which will enable the city administration further to hamper our operations. These actions naturally prevent the company from carrying out its program, and generally makes the situation untenable.

It is an outstanding fact, that when a utility is regulated in its procedure by a duly authorized governing body a duplication of plant and equipment cannot endure.

No business can survive unless it is self-supporting. Our contract with the city provided for one important item, namely, that we should be permitted to earn operating expenses, taxes, money with which to renew worn out plant and equipment and interest on the money invested.

Is there anything fairer than this?

Every business institution in Newark, and elsewhere, was founded and is being operated with the above principle in mind.

Much as we would wish to believe otherwise, we feel that our rights under the contract with the city have not been given consideration by those in authority, and it is with genuine regret, because of our loyal employees and the thinking citizens that have given us their support, that after four years of conscientious effort to serve the people of Newark we are compelled to announce our decision to abandon all city street railway and bus operations in the city of Newark at midnight of Aug. 10, 1926.

Our action is prompted solely by the unfortunate trend of events, and has been taken only after careful consideration of all the interests involved, and we wish to assure every one that it was our wish not to give up until every effort had been exhausted, and only when faced with the task of doing the impossible and we trust the public will be generous enough to see our point of view.

Our announcement would not be complete without an expression of appreciation for the hearty co-operation received from our employees and the citizens, who realize the seriousness of the situation confronting the city and ourselves.

Transportation Survey in Canton

At a meeting on Monday night, Aug. 9, the City Council of Canton, Ohio, engaged the Beeler Organization, New York, to make a complete survey of the railway, bus and traffic situations and to advise the city concerning the question of the renewal of the franchise of the Northern Ohio Power & Light Company, operating in the city under a grant which expires in February, 1928.

Alderman Approve Home Rule Plan for Chicago

A plan which would strip the Illinois Commerce Commission of substantially all of its control over public utilities in the city of Chicago and delegate such powers as the commission now wields to the local city government was approved on July 30 by Mayor Dever's "Home Rule" committee. The resolution creating this committee was introduced by Alderman J. M. Arvey several weeks ago and was referred to in the *ELECTRIC RAILWAY JOURNAL* for July 17, page 122.

The objective of the committee is to lay plans for submission of the question to a referendum at the Mayoralty election next spring, under the terms of Article 6 of the Illinois Commerce Commission act providing that any municipality may withdraw its utilities from the rule of the commission.

To call the proposed referendum, the committee's chairman stated, it will be necessary to obtain the signatures of 181,000, or 25 per cent of the city's voters. Circulation of petitions for such a referendum was discussed by the members of the committee at their meeting. Under the terms of the article it is also provided that the proposal must receive a majority of the votes cast in the Mayoralty election. If the referendum is successful the decision of the city would still be subject to appeal.

Corporation Counsel F. X. Busch says the article is replete with jokers and ambiguities and that its promise of home rule at the will of the electorate is illusory. He believes, however, that the hindering provisions are not insurmountable.

Fare Issue Revived in New York City

Controller Berry of New York City has demanded that the Board of Estimate take some definite action toward formulating a policy of financing subway construction and operation. This has lifted the 5-cent fare into renewed prominence in New York politics. The situation seems to be complicated, rather than simplified, by the recent decision of the city government to the effect that it is mandatory upon them to submit to the voters this November the Craig 5-cent fare referendum bill, passed by the Municipal Assembly last year too late to be put on the ballot at last year's election.

Controller Berry started the fireworks in July. At that time he wrote to each member of the Board of Estimate declaring that it was time for a show-down on the city's financial program. The Controller stated that it really costs approximately 7 cents to carry each person on the present subways, and in consequence the city has been forced to make up the deficit by taxation. It costs the city annually \$13,845,000 in payment of interest on subway bonds, besides the fact that \$300,000,000 of the city's credit is tied up in these bonds. The Controller demanded that it be decided at once whether the deficit should continue to be made up out of the city treasury or

the subways be made to pay for themselves by means of an increased fare.

In the meantime, Mayor Walker has flatly declared that he considers himself pledged to the 5-cent fare, which was such an important plank in the platform upon which he was elected. The situation is a ticklish one for the administration, since an increase in fare is sure to meet with opposition from subway riders, whereas an increase in taxation of benefited property is sure to bring forth lamentations from the taxpayers.

In this dilemma the Craig referendum bill offers the administration a Heaven-sent solution, in the opinion of New York politicians. The bill, if approved by the voters this fall, would make it impossible for the Board of Estimate to raise the subway fare until such a move had been approved by referendum vote, and furthermore, the board could not even submit such a change to the public until requested to do so by petitions signed by 15 per cent of the voters of the city. If this bill is approved by the voters this November, the administration will then be relieved of the embarrassing necessity of deciding definitely whether the 5-cent fare is to go or stay.

Paving Question Up Again at Lincoln

In the face of the fact that the voters at an election held a year or so ago refused to relieve the Lincoln Traction Company, Lincoln, Neb., from its liability for the paving of that portion of the street it occupied, the City Council is indisposed to take such action on its own initiative, even though company officers insist that relief of this kind is essential for the company. The city legal department is now working out the status of the pavement where the cars are to be replaced by buses.

City Attorney Peterson says that the situation seems reasonably clear. After pavement is laid or is ordered laid between the rails and 1 ft. on either side the railway must replace the paving and pay for it if it takes up the track. When the paving is done subsequent to the taking up of a track, the company will not be held for any part of the cost, which must be paid by the abutting property owner.

The city takes the attitude that wherever the bus is substituted, which, for the present, will be only on two long suburban lines, the company must maintain without loss of efficiency the services that are now established. The occupation tax is to be extended to the bus lines or, in lieu of that, a license tax will be imposed that will bring about as much revenue to the city. Mr. Chubb for the railway urged that this be abolished, but the city is not inclined to do this. This amounted to \$3,120 last year.

Mr. Peterson has recommended to the Council that it continue the occupation tax, as the license system applied to each bus would discourage the company from maintaining an adequate reserve of buses for peak load times and would relieve it from the bonding feature of the existing jitney ordinance.

Memphis Editor Comments on Street Car Riding

An editorial in the *Commercial Appeal*, Memphis, Tenn., of June 24 set forth the benefits of street car riding over the various other possibilities of traveling to business. It did this in a way that attracted the attention not only of the newspaper readers but of the railway company itself. The editorial follows:

ON STREET CAR RIDING

Came down town on the street car yesterday morning. Often ride the street cars. There were 25 cash fares on the car and two transfers. Half way down six street car men got aboard. The street car company hauled all of us from Peabody, near Cooper, to Main and Madison for \$1.75 cash and about 6 cents added cash.

If all of us on board the car had owned automobiles it would have taken 31 cars to haul us. If we had ridden down in taxis, say, two to the taxi, our fares would have been about \$17. It would have taken fifteen drivers to bring us down. The fifteen automobiles would have occupied a line in the street of about 20 ft. If we had all ridden down in our own automobiles the investment would have been about \$30,000.

Yet, the street car did the entire job for about \$1.80, besides hauling six extra men for nothing.

The street car did not take up any more room in the track than two automobiles would have taken.

Street car transportation to the user is the cheapest thing we know of. You step on the car and pay 7 cents, then step off and go about your business. You don't have to hunt parking space. You don't have to carry accident insurance.

And yet the street car business is declining. From a point of economy and efficiency, the business should not decline.

We had a nice time in the street car. It was about 11 o'clock and the car was not crowded. We had a set to ourselves. We read the morning paper and enjoyed Mr. Tracy's story about the mass meeting held at the Chamber of Commerce. Then we read of the prospective golf game which was to take place in England. Then, having a few minutes to spare, we read the *Busy Man's Corner* and thought on it for a few minutes.

If you can get a seat on the street car and you have something to read, you will not waste any time. If you haven't anything to read, you can look out and see the flowers in the suburbs.

You can look at the fine houses, then look at the humble houses. Then you can see some of the big rich, and see some of the very poor. Then if you begin thinking, you will soon find out that there is very little difference between the big rich and the very poor. If there is a difference, it will not be for long, because all of them will be dead in a few years, and all dead people are alike.

When we finished this, one secretary said: "You didn't tell them how long you had to wait to catch the car."

We caught the car on the minute. Another secretary said she knew the schedule on her line and caught cars as they came along.

All of which means that Mr. Tutwiler ought to put some more cars on some lines. More cars cost a great deal more money. If we had our way about it, we would have double the number of cars and put the present conductors on as motormen.

The Memphis Street Railway reprinted the editorial in its booklet "Trolley Items" with the following comment:

Regarding the foregoing editorial we should like to make two observations:

1. Thirty-two new street cars have recently been ordered and are expected to begin arrival by July 15. All of the new cars should be received within four or five weeks after the first shipment comes in. Thus we are meeting the newspaper editor's view for increased service—at least to the extent of about 20 per cent. No one is more pleased at being able to give good service than are the executives and employees of the street railway.

2. We want to offer a slight correction to paragraph six. It was true for about five years following 1920 that street car business declined. However, about nine or ten months ago the business over the country began to "pick up," and today a healthy increase over the depressed condition that obtained for about five years is evident.

In Memphis our increased patronage and revenues began to be evident along about August, 1925. The increase has been sustained throughout the months since that time.

We are hopeful to believe that the hardest days that the street railway has had to suffer are passed, and that from now on business will be better and better.

This condition is true not only in Memphis but throughout the country.

People have come to understand that street railway service is not only the most economical form of transportation but that it is also reasonably convenient, while being the safest means of travel on city streets.

We are happy to observe that editors of newspapers are manifesting the sane and commendable spirit of fairness toward street cars as that manifested by the editor whom we have quoted.

We appreciate very much his excellent statement of our own case.

The economy of street car riding, as he so clearly shows, is its great appeal. But the street car is a very important servant to every individual in the community, and deserves the cordial spirit of patronage which the writer of the editorial manifests.

Seventy-five and Still on the Job

Sixty years in the service of one company is a long time.

That is the record of Joseph W. Hicks, assistant to the president of the New York State Railways, who on Aug. 10 began his 61st year as an employee of that railway.

Back in 1866, when a lad of fifteen, "Joe" Hicks entered the employ of the

No Parking Rules Save Traffic Situation

In an open letter to the New York newspapers, H. J. Sheeran, chairman of the Manhattan Surface Line Operators Traffic Committee, and president of the New York Railways, has called public attention to one common factor in the emergency regulations governing the increased street traffic which followed the subway strike in New York and by the attendance at the Eucharistic Congress in Chicago—that was the "No Parking" order. He says in part:

In order to meet the emergency, Police Commissioner McLaughlin put into effect an order prohibiting parking on the more important longitudinal streets. The effect was immediate. Our thoroughfares seemed to widen overnight. In spite of the greater number of vehicles in the lower part of the city, traffic moved better than usual. There was less confusion and fewer traffic delays.

The no-parking order, according to Deputy Chief Inspector Coleman, resulted, for all practical purposes, in widening the streets 12 ft. It added a new automobile lane on each side of the streets.

Similarly, it was only through the adoption of no-parking regulations that Chicago was able to transport the huge crowds that attended the Eucharistic Congress. In a three-day period the Chicago Surface Lines carried a total of 15,056,000 passengers, or more than 5,000,000 daily. To appreciate the magnitude of this volume of surface travel, it is only necessary to compare it with the number of passengers carried on our own Interborough subway, which in



J. W. Hicks, Driving First Horse Car, Celebrated 60th Anniversary in Service at Rochester on Aug. 10

company, then the Rochester City & Brighton Company, as "a hillboy," driving extra horses on the trolley cars up the inclines of the city. Then he cleaned lamps in the carhouse and finally got a run of his own as "a motorman" on the horse cars.

His advance was steady to his present high post of assistant to James F. Hamilton, the president of the corporation.

"I have had so many anniversaries that they are getting to be an old story," the veteran railway man told an ELECTRIC RAILWAY JOURNAL representative on his anniversary day. And his 60th anniversary found Joe Hicks, an alert, vigorous figure despite his 75 years, right on the job, putting in a full day's work.

His service record is believed to be without a parallel in the East. It was reviewed at length in an article about Mr. Hicks in the ELECTRIC RAILWAY JOURNAL for Sept. 12, 1925, page 420.

the year ended June 30, 1925, averaged 2,018,000 daily.

Thus, street cars in America's second city were able to provide an emergency service which carried nearly two and a half times as many people as are carried daily on our far-famed subway system. They were able to do this solely because of traffic regulations which recognize the fact that mass transportation is more important than private transportation.

The New York correspondent of the Cincinnati *Times-Star* wrote to his paper that a miracle occurred. On the first day of the strike, although street traffic must have increased enormously, it moved more smoothly than it had done for years. The police had a great many other and more drastic changes in traffic rules under consideration, but this one change made traffic move so steadily and swiftly that no other was required. "The inevitable conclusion," he says, "is that one-half the ordinary parking is unnecessary, and that it is the unnecessary parking which makes all the traffic troubles."

Pay Advance Suggested for San Francisco Trackmen

The Board of Supervisors of San Francisco, Cal., has adopted a resolution urging the Mayor to direct the Board of Public Works to increase the wages of trackmen and others employed by San Francisco Municipal Railway who were not given the 40-cent wage increase granted to trainmen last spring.

Secretary John O'Connell of the San Francisco Labor Council said that the men were entitled to the increase, and that it had been promised them. It is said the trackmen are getting the equivalent of the platform men now, and besides have two days off a month.

Suggestions Sought from Baltimore Employees

The United Railways & Electric Company, Baltimore, has just put into operation a plan of payment for ideas suggested by employees of the company. All employees with the exception of department heads are eligible and the company has announced to them that awards of from \$5 to \$100 will be made, according to the value of the suggestions. As the plan is not a contest the employees are permitted to send their suggestions to the committee on efficiency awards at any time. The efficiency committee will place a value on the suggestions and the awards will be made by Charles D. Emmons, the president of the company.

All the suggestions made by the employees must be original. The employees need not confine their suggestions to the work of their own departments and ideas may be developed by two or more employees working together, in which case the award will be divided equally. If the suggestion is one that requires time to present in clear, understandable form, the employee is permitted to present a brief written statement of it at once, entitling him to priority in case the same idea is submitted by another employee.

Key System Living Up to Its Promises

Charging that the Key System Transit Company, Oakland, Cal., has failed to live up to its share of the agreements whereby fare increases on street cars and ferries were granted last January, Mayor John L. Davie has demanded that the fare increases be rescinded.

The ELECTRIC RAILWAY JOURNAL of Feb. 20 recorded the agitation aroused when the street-car fare was raised from 6 cents to 7 cents, and ferry rates from 18 cents to 21 cents.

The Mayor asserts that the company agreed to make certain improvements in the way of ferry and pier facilities, purchasing 120 new street cars and constructing new car lines. He contends that the company is purposely delaying the work so that it will not be ready for the continuance of the original rate hearing, set for Sept. 14.

In answer to the Mayor's assertions, G. H. Harris, general manager of the Key system, states that the company

is fulfilling every obligation; that it is expending \$9,000,000 in carrying out not only the orders of the commission but additional improvements of its own; that two new boats are already under construction; that more than \$2,000,000 has already been spent and a reconstruction plan of \$2,000,000 is under way.

Electric Suburban Service of Illinois Central Formally Opened

With company officials and 2,000 invited guests abroad, including scores of railroad and steamship executives, the first electrically operated suburban train of the Illinois Central Railroad made a triumphant run of 28 miles from Matteson, Ill., to the heart of Chicago in Aug. 7. Although test trains and a few "off-peak" passenger trains have been operating over a portion of the suburban divisions for several weeks, the day marked the official opening of electrified service on a substantial part of the Illinois Central's nearly 40 miles of suburban system.

More than 100 business and civic organizations of Chicago's south side participated in the mammoth "Pageant of Transportation" in Grant Park which followed the arrival of the first through electric train. Every mode of transportation used in Chicago since the day of Father Marquette was depicted in the giant tableau.

When the changeover to electric operation is completed early next month, the Illinois Central expects to have about 12 per cent more suburban trains in operation and 50 per cent more passenger carrying facilities than in the day of steam operation. Train schedules will be speeded up, it is announced, to save anywhere from 7½ to 30 per cent in the time it now takes commuters to get downtown, the relative saving depending on the length of ride and the number of stops. A two-minute headway will be maintained during rush hours.

On Aug. 9, two days after the formal opening, 250 of the 402 week-day suburban trains operated were electrically driven. The South Chicago branch, 5 miles in length, is completely electrified and all local trains on this line and from Randolph to 67th Streets on the main line are now being operated by electric power. The only steam service remaining is on the through trains between Chicago and Matteson and on the Blue Island branch, and this will probably be fully electrified by Sept. 1.

For electrification and parallel betterments the Illinois Central had spent up until June 30, the following amounts:

New cars and equipment	\$11,353,600
Wires, tracks and stations	6,389,000
Elimination of grade crossings ..	8,127,000
Changing track grades	4,026,000
Constructing Markham freight yard	11,711,000
Other improvements	10,771,000
Total	\$52,377,000

Ever since the plans for the improvement were first announced by the Illinois Central the prospective benefits have been reflected in conditions along the entire suburban routes.

Transportation Halted by Severe Storm

One of the severest thunder storms in years was experienced at New York just before the evening rush hour on Aug. 12. The Interborough Rapid Transit lines, both Seventh Avenue and Lexington Avenue routes, were paralyzed by floods at a dozen different points, and in some cases trains were delayed several hours.

The Long Island Railroad was hardest hit, for floods in the East River tunnel completely halted all service, and moreover, prevented the Pennsylvania from keeping up its main line service, since its trains are made up in the company's yards in Long Island City, across the East River. Surface cars managed to keep fairly close to a normal schedule, in spite of the flooded streets.

Re-Electrification of South Shore Completed

With the completion of the re-electrification program of the Chicago, South Shore & South Bend Railroad on July 28, the company's new steel passenger cars began operating over the entire line from South Bend to Kensington.

For a short time South Shore trains will continue to be hauled from Kensington to downtown Chicago, a distance of 15 miles, by Illinois Central Railroad steam locomotives. The Illinois Central, however, will in the near future begin regular operation of its electric suburban trains from Kensington to Randolph Street and then South Shore trains will be run to the downtown terminal under their own power.

While the change-over from alternating to direct current for train operation has been completed, the company's rehabilitation program continues. Improvements are being made in the track, thousands of new ties are being laid, and new siding are being built. Improved service and faster running time are soon to be effected.

Concessions Sought from Railway in Elizabeth

Frank J. Travers and Dennis F. Hennessy have been appointed a special committee to conduct a survey of the transportation service of Elizabeth, N. J., and to recommend a plan for the adoption of a single fare system within the municipality.

The committee intends to confer with officials of the State Board of Public Utility Commissioners and the Public Service Railway in an effort to obtain their consent to the rerouting of certain trolley and bus lines with a view of providing service to permit passengers to travel from the western part of the city to the downtown section for a single fare without being obliged to change cars in Broad Street.

The committee members propose to investigate the situation before deciding the question of employing a transportation expert, as recommended by the Civic Council on Transportation, which was formed recently by representatives of Elizabeth improvement associations and the Chamber of Commerce.

Negotiations for New Franchise for Sandusky

Negotiations are in progress between the Lake Shore Electric Railway, Cleveland, Ohio, and the city of Sandusky for a new franchise. The one under which the company has operated for 25 years expired on July 30.

In its application the company asks the right to charge a 7-cent fare instead of the present 5-cent fare. The city has indicated through the City Commission, that 7 cents is considered too much.

The city, on the other hand, wants the company to stand a share of the expense of elimination of dangerous grade crossings, and the company has let it be known that it does not favor the proposal.

Grand Rapids Rides in New Cars

An account is given in the July book-let published by the Grand Rapids Association of Commerce of the new cars of the Grand Rapids Railway, Grand Rapids, Mich. Much of the credit for installing these new coaches, selected after much experimenting and comparing as regards convenience, comfort and operation, is given to L. J. DeLamarter, vice-president and general manager of the railway. The president of the Association of Commerce says that there is a tendency on the part of the residents of Grand Rapids to ride in these new cars in preference to taking their own autos to and from business—a great step forward in reducing traffic congestion in the business section of the town.

New Color Standard in Cincinnati

Decision to standardize on a uniform color for street cars and buses has been made by the Cincinnati Street Railway, Cincinnati, Ohio. This will necessitate changing the color of the bodies of the electric cars operated over the system from yellow to burning brush orange. The buses operated by the company are painted in the latter color, trimmed with cream. Walter A. Draper, president of the company, states that the work will be done gradually in order not to interfere with the transportation service. The yellow color has been the standard for the past five years, prior to which time a light lemon shade had been in vogue for approximately 30 years.

Safety Contests at Rochester

To promote safety on the Rochester lines of the New York State Railways, Leon R. Brown, safety director of the company, has started a contest among the divisions, with the leader receiving a banner at the end of each month. For July the State Lake division won the banner, with a record of only one accident for every 19,000 miles.

The banner was presented by Roy R. Hadsell, general superintendent, at a meeting addressed by a representative of the Safety Council of the Rochester Chamber of Commerce.

Mr. Brown said there were 378 men in the company's service with a perfect record so far this year. Those who

have no accidents for an entire year are given a \$1,000 sick and accident insurance policy as a reward.

The team of ten men with the best safety record for the year receives new uniforms throughout.

By these means, Mr. Brown declared, accidents on the Rochester lines of the New York State Railways have been reduced to a minimum.

Arrangements Made for Milwaukee Traffic Survey

The Common Council of Milwaukee, Wis., has acted favorably upon the recent proposal of S. B. Way, president of the Milwaukee Electric Railway & Light Company, in which he suggested that a thorough traffic survey be made in Milwaukee with the idea of obtaining an impartial insight into street transportation needs. In his letter to the Common Council Mr. Way said the cost of this city-wide survey would be met by the company providing it did not exceed \$50,000.

Direction of this transportation survey will be undertaken by the transportation survey committee of the Common Council. One of the first steps taken by the new committee was the employment of McClellan & Junkersfeld, New York, to compile the data upon which the future transportation needs of Milwaukee will be made.

C. U. Smith, Milwaukee harbor terminal director, has been elected chairman of the committee. An executive committee composed of one member from each of four representative groups was appointed. The members named were William A. Jackson, vice-president of the Milwaukee Electric Railway & Light Company; W. H. Damon, resident engineer of the Wisconsin Railroad Commission; P. A. Koehring, president of the Milwaukee Association of Commerce, and Mr. Smith.

The city's contract with the engineering company provides that the committee shall have full authority over the survey work. The Milwaukee Electric Railway & Light Company will have nothing to do with the actual work

other than to permit the co-operation of its own engineers. Reports will be made direct to the committee.

Records Being Made by Wisconsin Interurban

That business on an interurban line can be increased if proper steps are taken to bring such a system up to a degree of efficiency from the standpoint of service, safety and equipment to enable it to compete successfully with the private automobile and bus is shown in the operation of the Milwaukee Electric Railway & Light Company's new high-speed line connecting Milwaukee, Waukesha and Watertown, and covering a route of about 50 miles.

Since this service was started on June 14 patronage on the interurban line has increased fully 40 per cent.

More than \$1,000,000 was spent for the construction of 5½ miles of new double trackage cutting through sparsely settled sections west of Milwaukee. Frequent service, up-to-date equipment and operation over a private right-of-way through suburban towns were factors which enabled the company to offer a service equal to or better than the time required to reach these cities by automobile or bus.

Winter schedules are now being prepared. The company expects to continue the present half hour service throughout the year. The present running schedule from Milwaukee to Waukesha is only 35 minutes. It is easily maintained and may be reduced to 30 minutes later.

Action on Paving Relief Delayed at St. Paul

Action by the voters of St. Paul, Minn., on a charter amendment to carry out the suggestion of the Minnesota Railroad and Warehouse Commission that the city relieve the St. Paul City Railway of the cost of paving between its tracks has been delayed to the fall election. The charter commission did not act in time to include the proposed amendment in a special charter amendment election on Aug. 24. In making a valuation of the railway in fixing a reasonable rate of fare the state commission noted that the railway was being too heavily burdened by taxes to be able to make its 7½ per cent return on valuation at the proposed rate of fare. This was last year and action is still delayed, after seven months.

Traction Company Athletes Honored

The Beaver Valley Traction Company and Beaver Valley Motor Coach Company, New Brighton, Pa., celebrated the success of their track team in taking second place in the recent Beaver County Industrial athletic field meet by holding a banquet on July 27. C. D. Smith, general manager, distributed medals to those men who won events. The company's team was the dark horse of the contest and surprised the spectators by carrying off second place. The meet was won by the Babcock & Wilcox Tube Company.

Railway Offers Bridge for Detour in Ohio

Engineers of the Ohio State Highway department estimate that motorists using the National Highway through Springfield, Ohio, will be saved nearly \$30,000 in the next ten weeks as the result of the action of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, offering the state the use of its traction bridge as a short detour while the regular vehicle bridge is being repaired. The state will maintain watchmen to guide traffic and has also agreed to release the company from any liability in case of accident and to see that the company's cars are not delayed. Prior to the offer by the railway the detour used was several miles in length and terribly rough. The traction bridge is planked for the vehicles.

Weekly Pass in Madison

Daily users of the Madison Railways, Madison, Wis., were offered a bargain during August when the company decided to adopt the weekly pass system as a means of increasing patronage. Passes will be sold for \$1.25 and will be good for an unlimited number of rides on all lines during the week for which the pass is dated. Passes will not be accepted on the company's bus line.

Slower Speed Suggested for Schenectady-Albany Service

A further conference between members of the Public Service Commission and representatives of the Schenectady Railway and the cities of Albany and Schenectady over operating conditions between Albany and Schenectady took place on Aug. 11. The report of the engineer of the commission recommends a reduction in the speed of cars between the two cities. Express cars now take 50 minutes and locals 55 minutes to make the 17-mile trip. It was suggested on behalf of the railroad that all cars operate on a 30-m.p.h. basis. The conference was closed pending an order to be made by the commission.

Franchise Action in Kansas City Unlikely Now

Action on the proposed franchise for the Kansas City Railways, Kansas City, Mo., appears unlikely before fall, possibly not until after the November election, as several members of the Council will be out of town during August. The franchise must have three full readings by the Council before any action can be taken. The Mayor has suggested that a sub-committee be appointed to work out a franchise plan that will be acceptable to both the city and the railway.

More One-Man Cars for Milwaukee

The application of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for permission to substitute one-man cars for two-man cars on its Wells-Downer line beginning Oct. 1 has been approved in a preliminary order by the Wisconsin Railroad Commission. No one opposed the use of one-man cars on this route. The company was notified promptly of the commission's action in order to allow ample time to remodel cars. When the company advises the commission that it has the equipment ready a formal order will be issued to start the service. The company plans to replace ten two-man cars with twenty one-man cars.

World's Playground Plans Added Facilities

Extensions to Atlantic City's transportation system are being planned by a group of local business men headed by B. George Ulizio to serve sections of the city not now reached by electric railway lines.

Present plans, which are based on

recommendations made in a survey of the city's transportation needs by Fisk & Roberts, New York, call for four bus routes: A longitudinal line on Arctic Avenue, which runs parallel with the ocean front about half a mile inland; a route from the business section of Atlantic City to Pleasantville, northwest of the city, and two crosstown routes connecting the Boardwalk with the center of the city.

The report of Fisk & Roberts shows that of the 4,832 persons who enter the city during the morning rush hour 78 per cent are carried by the electric railways and 22 per cent by the 200 jitneys which operate on Pacific Avenue.



News Notes

Virginia Electric Only Bidder for Blanket Traction Franchise.—The Virginia Electric & Power Company, Richmond, Va., was the only bidder for the new blanket traction franchise before Common Council recently. That company offered \$1,000 for the franchise, and in presenting this bid also filed its certified check for the amount specified, as well as a certified check in the sum of \$10,000 as a bond requiring the company to observe the provisions of the franchise. Without debate, and in accordance with the rules, the paper was referred to the streets committee for recommendations.

One-Man Cars for Ohio Line.—One-man car operation has been installed by the Northern Ohio Traction & Light Company, Akron, Ohio, on its Canton-Massillon interurban line. At the same time a new Nachod signal system which it is believed will be an aid to motorists at the crossings was installed. The signal system is known as the three-position following protective system. Green, yellow and red lights are used.

Rail Removal at Springfield Arranged.—The Springfield Street Railway, Springfield, Mass., has agreed to the decision of City Engineer O. E. Parks, Westfield, Mass., to start immediately to take up the rails of the abandoned lines in Westfield. The rails on Mill and Union Streets will first be removed. Officials of the railway have agreed to pay the city 70 cents a foot for replacing the pavement destroyed in carrying on the work. The work is to be done under the supervision of the city.

Railway Opposes Buses in Massachusetts.—The East Taunton Street Railway, Taunton, Mass., is opposing the petition of John J. O'Connor to operate his Taunton Bus Line on a schedule conflicting with the trolley schedule. At a recent hearing before the Public Utilities Commission Mr. O'Connor said that the bus service did not compete with that of the railway inasmuch as the bus company charged a 10-cent fare and the trolley a 5-cent fare.

Baltimore Boosters Club Has Rail Representative.—Raymond S. Tompkins, assistant to the president of the United Railways & Electric Company,

Baltimore, Md., has been appointed a member of the executive committee of a commission recently named by Mayor Howard W. Jackson to plan ways and means to attract more visitors to the city. Mr. Tompkins represents the various public utilities corporations on the committee.

Missouri Tariff Regulation Extended for Six Months.—The Missouri Public Service Commission at Jefferson City, Mo., on July 29 extended for a period of six months additional, effective Aug. 1, the temporary tariff authorized on Jan. 25 on the Missouri Electric Railroad, St. Louis, Mo. As reported in the *ELECTRIC RAILWAY JOURNAL* of Feb. 6, the January order established fare zones between Wellston and St. Charles, a fare of 7 cents for each zone being permitted. This reduced rate, as was hoped, eliminated the independent competing bus line.

Would Force Company to Pave Between Rails.—In an effort to force the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., to pave between its rails in South Fourteenth Street, the City Council at New-castle, Ind., has passed an ordinance establishing a speed limit of 5 m.p.h., through the city for interurban cars and providing for complete stops at all street intersections. Residents of the street are averse to paying for the paving between the rails. The controversy has existed for more than three years.

Hearing Completed on Abandonment of Utah Line.—The hearing has been completed on the application of the Utah Light & Traction Company, Salt Lake City, Utah, for permission to discontinue service on part of its Third East Street Line and to remove the track. The case was taken under advisement. The company contends that patronage on this route is not sufficient to warrant its continuation and that the territory will be adequately served by other lines. Mention of the company's application to abandon the line was made in the *ELECTRIC RAILWAY JOURNAL* of July 17.

Approves Transfer Charge.—Approval of a transfer charge of 2 cents per passenger, to be collected from passengers of the Birmingham Electric Company, Birmingham, Ala., transferring from the Mountain Terrace car line to other lines, including the Highland Avenue and Lake View lines, has been granted by the Alabama Public Service Commission. Order of the commission was in response to a petition filed by the company asking such approval.

Six Held for East St. Louis Hold-Up.—Five men and a woman are held by the East St. Louis police charged with participation in the \$8,100 hold-up of a car of the East St. Louis & Suburban Railway at Nineteenth and State Streets, East St. Louis, Ill., on July 19 while the car was en route to a downtown bank with fare collections from the previous Saturday and Sunday. The police say they have a written confession from one of the men and an oral confession from another involving all the others held. Some of those accused have denied any connection with the robbery. The money has not been recovered.

Recent Bus Developments

Action Brought Against Competitor of Illinois Interurban

Charging that the Royal Rapid Transit Company, which operates interstate bus service between Madison, Wis., and Chicago, Ill., is carrying passengers between points within Illinois without state authority, the Rockford & Interurban Company, Chicago, Aurora & Elgin, Elgin & Belvidere Railroad, and the Aurora, Elgin & Fox River Electric Railway, all of whose lines are paralleled by the present route of the Royal buses, have started injunction proceedings against the Royal company.

The railways maintain that the bus line is picking up and discharging passengers within Illinois cities in violation of the law which allows bus lines to discharge passengers at Illinois points only when they have boarded buses in Wisconsin.

It is reported that application has already been filed by the Royal company with the Illinois Commerce Commission for permission to discharge passengers within the state. The bus line denies that passengers are being taken on and discharged in Illinois cities.

Railway at Akron Largest Ohio Bus Operator

The Norman bus line, operating independently in Akron, Ohio, has been purchased by the Northern Ohio Power & Light Company for the value of the equipment. Five additional buses for city service were secured. The line will be co-ordinated with the company's Grant Street and Firestone Park lines serving the factory district in the southern end of the city. There now remains only one independent bus line in Akron.

In view of the purchase of this line and the success of the company's Grant Street bus line it is probable that the Grant Street car line, which has not been operated for several weeks, will be permanently abandoned. The company at Akron is operating approximately 250 buses in its city and interurban service. It is the largest operator of buses in Ohio.

Buses to Be Run by Nebraska Interurban

The Omaha, Lincoln & Beatrice Railway, which operates between Lincoln and its two northeastern suburbs of University Place and Bethany, college towns, has applied to the Nebraska State Railway Commission for authority to abandon a shuttle service run for the convenience of University Place riders and substitute a 30-minute bus service between University Place and Lincoln. No abandonment of tracks is contemplated and the service on the main line will remain as at present, with a 6-cent fare. University Place riders will pay 10 cents cash with three

tokens for a quarter for bus riding, instead of a 7-cent fare as on the cars.

No attempt will be made to invade with buses any of the downtown territory of the Lincoln Traction Company. The buses will traverse the same loop in the business section that the interurban has been serving for years, north of the main thoroughfares.

Co-ordinated Service in Lincoln

The Nebraska State Railway Commission has authorized the Lincoln Traction Company Lincoln, Neb., to make its first installation of co-ordinated bus and electric car service. In addition to abandoning the short line car service in North Lincoln adjacent to the University of Nebraska the commission permits the abandonment of track from Marion and Fourteenth Streets to the state penitentiary, a distance of 2 miles. This will relieve the

company of considerable new paving expense. It withholds approval of the removal of tracks to the state hospital for the insane.

The buses will be placed in service on two 5-mile suburban lines, one to the state prison south of the city and the other to the state hospital to the southwest. They will make a loop through the main business streets and use the same south-pointed street for 1½ miles. The buses will operate on the existing car schedule and will transfer and take on passengers from the street cars. They will operate on paved highways all the distance covered.

These cars now operate on South Tenth Street and the same schedule as now will be maintained by adding another car and making the new terminus of all Tenth Street cars six blocks distant from the old. South Fourteenth cars will be made into double-enders and stop at Marion.

The commission says that this may prove to be the solution of the problem of inducing enough persons to ride to produce sufficient revenue to justify continuation of the service.

The fare will be 10 cents cash, with four tokens for 30 cents.

Review of I.C.C. Bus Hearing

Attempt Made to Interpret Testimony Introduced at Chicago by Electric Railways, Steam Roads and the Motor Carriers—Commission Will Have Vast Mass of Facts Upon Which to Draw

THREE hearings have been held by the Interstate Commerce Commission in its inquiry into the motor bus and the motor truck movement. They were conducted at Chicago on July 27, 28 and 29, at St. Paul on July 30 and 31 and at Portland on Aug. 11.

Of course a mass of facts is being collected. Some of them are new, but many are merely reiterative. The record certainly will be complete on which the commissioners will draw in basing their conclusions. Whatever else may go into the record there will be no mistaking the cases of the various interests involved. Each of them—the electric railways, the steam railroads and the motor interests—is taking able care of that. Not only that, but the public has been well represented. As one of its spokesmen expressed it, the public is engaged in choosing the type of transportation it prefers and in fitting the various available means of transportation into their respective fields of greatest utility.

The fact that many of the data are reiterative makes it seem more desirable to interpret the trend of the testimony than to go into the presentations as such. At the outset it is well to bear in mind that the whole series of hearings is an inquiry by the Interstate Commerce Commission based on the cognizance taken by it of the increasing extent to which the motor vehicle is becoming a competition of the regulated carriers. The purpose, of course, is to collect facts to be used in making legislative recommendations to Congress.

It may be jumping at conclusions to say so, but it does appear from the data

so far placed in evidence that those electric railways have suffered least which were the first properly to sense the magnitude of this traffic by bus and by truck and to turn these vehicles quickly to their own advantage. So far as the need for regulation goes, the electric railways appear to be very much of the same opinion as the steam railroads, namely, that there should be federal regulation of motor common carriers engaged in interstate commerce.

The bus operators and the truck operators are opposed in some of their views; at least they were at the hearing at Chicago. They do not disagree on the general question of regulation, but they do disagree on just what is best to be done at this time. Some bus operators favor state control only, while others advocate comprehensive federal regulation. On the other hand, the truck interests appear to feel that any sort of regulation at this time is inadvisable. If there must be regulation, then they want it limited to state authority to issue certificates of convenience and necessity and to require prospective operators to make satisfactory showing of financial responsibility for the protection of customers and the public against loss.

These points of view are not new. They were hammered home at Chicago and will likely continue to be hammered home in each of the subsequent hearings. Still, individuals interpret the same set of facts differently. And this is being done quite freely. One commentator said:

"After the passenger business was once taken from the rails by the auto-

mobile, it was partially recovered by buses but only a small percentage, almost akin to the invisible, was lost directly to the bus.

"When that fact once becomes officially established, it is probable that steam and electric officials will find it convenient and consistent to be pro-rail without being quite so anti-bus, in the same way that the bus industry has always maintained a pro-bus attitude without finding it necessary to adopt an anti-rail policy."

This same man also said:

"The bus only becomes a serious competitor of rails when it bids for the business the rails have already lost."

Railroads, both steam and electric, had their innings on the first day, July 27. Only three spokesmen appeared for the steam railroads, while nine were present representing the electric railroads. B. F. Eustice, general passenger agent of the Chicago, Burlington & Quincy Railway, the first witness called for the railroads, confined his remarks to bus operation by his company and that run in competition with it. He explained his railroad was not actively engaged in bus operation. According to him, competition was purely local, confining itself to paved or well-maintained roads between fair-sized towns. The policy adopted by his railroad was to put on bus service where it is demonstrated that it is a cheaper method of performing a given transportation service, and to abandon service, both rail and bus, where the public patronage has decreased to a point where it is not successful.

For the electric railroads, C. L. Henry, president of the Indianapolis & Cincinnati Traction Company and counsel for the American Electric Railway Association, related the difficulties of the electric railroads in Southern Indiana in combating bus competition up to and after the passage of the regulatory act by the Indiana Legislature. He attributed a drop of approximately 70 per cent in gross income on his own road in the past two years to motor vehicle competition—the majority of this loss to the private automobile. He did not know what percentage could be laid to the bus.

C. K. Jeffries, general superintendent of the Terre Haute, Indianapolis & Eastern Traction Company and president of the Central Electric Railway Association, testified similarly. He stated that his company had purchased an independent competing bus line as a matter of self defense.

F. D. Norviel, general passenger agent of the Union Traction Company of Indiana, explained the scope of bus and truck operation as it affected these lines. He presented several exhibits to be filed with the commission, showing the route of the Union Traction System and those of supplementary and competing bus lines. His exhibit also included a statement of loss in revenue attributable to the motor vehicle, the private automobile being the instrument causing the greatest damage.

Samuel Lipp, Cincinnati, Ohio, bus operator, questioned the statement of Mr. Norviel to the effect that 25 per cent of the gross revenue loss was due to the bus and truck. Charles W.

Chase, vice-president of the Chicago, South Shore & South Bend Railway and president of the Gary Railway and the Shore Line Motor Coach Company, gave details of the operation, stating that his company now ran 300 miles of bus route with a total of 6,000,000 bus-miles a year. According to Mr. Chase, it was impossible for him to estimate the loss to the electric railroads and steam railroads in interstate traffic between Chicago and Hammond, Gary, and Indiana Harbor, due to bus competition. However, from his own experience in operating buses, and from estimates he has made from gross revenue of competing bus lines, he would say that \$2,000,000 a year in revenue was lost to the steam and electric railroads operating from Chicago and these nearby points. The entire bus operations by the Shore Line Motor Coach Company had been at a loss, but certain lines, particularly the one into Chicago, which is purely interstate, had shown a profit.

Lack of interstate regulation of buses was deplored by G. W. Welsh, vice-president of the East St. Louis & Suburban Railway. He declared this to be the reason for the competition which his company suffered between East St. Louis, Ill., and communities in the south western part of the state. While no difficulty is experienced in intrastate traffic in Illinois, because of the state law in effect, the company has suffered a loss in revenue because the bus operators are permitted to parallel electric lines and operate across the state line into Missouri. Three years ago Mr. Welsh's company established the Blue Goose Bus Line to operate interstate into St. Louis, Mo. Although this company operates under certificates of convenience and necessity in the State of Illinois, it is unregulated in so far as the interstate operation is concerned. Despite this motor carriers took away a large amount of the business which rightfully belonged to the rail line.

C. F. Handehy, special representative of the Illinois Traction System, explained that except for interstate operators between Chicago and St. Louis his property was free from bus competition. However, injunctions obtained against two of the bus companies between Chicago and St. Louis had prevented these companies from doing intrastate business between points along the electric line and St. Louis, Mo.

C. E. Thompson, vice-president of the North Shore Line, declared that inasmuch as the Chicago, North Shore & Milwaukee Railroad had been alert to provide bus service in its territory where such service was needed the company now had no bus competition. Fares on the 47 buses operated over 200 miles of route by his company are 10 per cent higher than those on the electric line for the same mileage. The buses act as feeders to the two main electric rail lines of the system.

This, of course, is the merest skeleton of the testimony as it affects the electric railroads, but it does tend to indicate the extent of their participation in the proceedings, particularly at Chicago, and affords some criterion as to the data that are going into the record.

Approval of Binghamton Deal Sought

The Binghamton Railway Bus Line, Inc., Binghamton, N. Y., on Aug. 9 applied to the Public Service Commission for the right to lease the property, assets, rights and franchises of the Triple Cities Bus Lines, owned by Edward J. Dorey, operating between Binghamton and nearby communities. The stock of the petitioner is owned by the Binghamton Railway, which states that it has amended its certificate of incorporation so that it may operate the bus lines in conjunction with the existing service by the trolley line, if the petition is granted. In the purchase there are included eight buses, which will bring the total number of buses owned and operated by the Binghamton Railway up to eleven. Under the plan, this belt line will be combined with the bus line now being operated by the railway so as to cover more territory.

Mr. Dorey still retains his so-called South Side line in Binghamton and his line to Montrose, Pa.

More Bus Lines for St. Paul

The Twin City Motor Bus Company, St. Paul, Minn., subsidiary of the Twin City Rapid Transit Company, has applied for five local lines in Minneapolis, extension of a suburban line from Glen Lake to Excelsior, and changes in headways of intercity and suburban buses out of St. Paul to White Bear, Bald Eagle and South St. Paul. The Minneapolis permits will cover crosstown connecting lines with transfers to and from trolley lines, and a new line from the Great Northern Railroad station to Lakewood Cemetery, about 3 miles, on which the fare will be 10 cents.

Two New Bus Routes in Omaha.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., announces the addition of two more new bus lines to its service. One route will be between 32d and Arbor Streets and 40th and Marinda, the other between 50th Street and Underwood Avenue and 52d and Franklin Streets. The company has ordered three new 21-passenger buses from the Nebraska Auto & Truck Manufacturing Company, which promises delivery in 60 days, for use on these lines. Adverse conditions confronting the company prevent the starting of several other new routes it had hoped to announce.

Company Would Abandon Indianapolis Bus Line.—The Indiana Motor Transit Company, the bus subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has filed a petition with the Indiana Public Service Commission asking authority to abandon its bus lines between Frankfort and Monticello, Ind. The petition showed that it cost the company 22 cents a bus for each mile, and that for the period from April 14 to June 13 the loss was \$3,350. The company therefore believes that the patronage is not sufficient to warrant operation.

Financial and Corporate

Maryland Company Seeks Modification of Court's Opinion

A motion seeking modification of an opinion handed down recently by the Court of Appeals of Maryland, under which the valuation case of the United Railways & Electric Company, Baltimore, was remanded to the Maryland Public Service Commission, has been filed by counsel for the company. In remanding the case the Court of Appeals held that the easements, which the commission had valued at \$7,000,000, had been valued in the wrong manner, but should have been based on value in real estate. It was said by the court that the commission having based its valuation upon the assessments which necessarily include earnings, the method was not in accordance with the law.

In the motion filed by the railway it is claimed that the Court of Appeals was mistaken in its opinion that the commission failed to value the easements as value in real estate.

The motion created considerable comment. It was taken by some of the newspapers as a step on the part of the company to increase fares. This brought about a strong denial on the part of the United. Raymond S. Tompkins, assistant to the president of the company, issued the statement on behalf of the company.

Connecticut Interurban Resold

The Hartford & Springfield Street Railway, Warehouse Point, Conn., was sold on Aug. 10 to Arthur L. Linn, Jr., Newport, R. I., for \$190,000. Judge Dickenson of the Superior Court approved the sale and announced that further hearings in the matter would be held for the benefit of bondholders of the Rockville, Broad Brook & East Windsor Street Railway to settle on the amount to be received for the bonds in their possession. A hearing is scheduled for Sept. 17 to arrange this matter.

Payments for the Hartford & Springfield have been arranged in the following manner: \$25,000 goes at once to the bondholders' protective committee, \$50,000 to Receiver Harrison B. Freeman on or before Sept. 1, \$22,000 to the same party by Oct. 1 and \$28,000 to Francis B. Cooley, who bought the property at a mortgage foreclosure sale for \$10,000 subject to the claims of the receiver, and the balance, \$65,000, to be paid Oct. 16.

Expenses and liabilities of the receiver are \$137,000. The amount of money represented by bonds of the property is \$200,000, of which \$181,000 is on deposit at the First National Bank, Hartford. When expenses have been paid it is estimated \$20,000 will be divided among the bondholders, about 700 in number. Expenses of appraisers, receivers' counsel and the reorganization committee will be about \$10,000.

Lucius F. Robinson, counsel for the

bondholders' protective committee, presented the case. Ralph O. Wells was state treasurer's representative for the bonds involved, and Josiah H. Peck appeared for the Windsor Locks Traction Company, a part of the Hartford & Springfield Street Railway.

Immediately after the sale papers were filed with the Secretary of State for the organization of the Hartford & Springfield Coach Company. Arthur L. Linn, Jr., Newport, R. I., president of the Newport Electric Company and vice-president of the Utilities Light & Power Company, was named president of the new bus company. Other officers are: Vice-president and manager, Arthur C. Marshall, Orlando, Florida; secretary, Arthur L. Shipman, Hartford, Conn., and treasurer, Dwight A. Pierce, Hartford.

About a month ago all railway service of the Hartford & Springfield Street Railway was discontinued and bus operation substituted. With the organization of the coach company will come further development and extensions to the bus service.

10-Mile Indiana Road to Be Sold Aug. 27

The Lebanon-Thorntown Traction Company, Lebanon, Ind., will discontinue operation shortly and offer the railway for sale as a whole or by parts. Mention of the company's application to abandon the line was made in the *ELECTRIC RAILWAY JOURNAL* of July 17. The bids will be received at the office of Rogers & Smith, Lawyers, Lebanon, Ind., by Robert P. Woods, president, at 10 o'clock a.m., Aug. 27. Right is reserved to reject any or all bids.

The property consists of an electric interurban railway operating between the center of the city of Lebanon, and the center of the town of Thorntown, distance of approximately 10 miles. The railway is adjacent to and parallel with the Chicago-Indianapolis Division of the Big Four Railroad.

The railway was opened for service July 4, 1905, at which time the track was fully ballasted with clean gravel. It is a single track with two single-end turnouts. The maximum grade is 1 per cent.

The company owns a right-of-way varying in width from 40 ft. to 50 ft. throughout the length except where operated over streets in the two municipalities mentioned. It owns all of the track, poles and wires throughout, except that of about two-thirds of a mile on the street in Lebanon. The single-track length of the Lebanon-Thorntown Traction Company is about 9½ miles.

The company owns the two passenger cars, but only one is required in the regular service. The two combination passenger and baggage cars were made by Cincinnati Car Company. Power is purchased.

Mr. Woods may be addressed at 530 Railway Exchange Building, Kansas City, Mo.

Conditional Sale of Morgantown Properties Arranged

Conditional sale of the property of the Union Traction Company, Morgantown, W. Va., to the West Virginia Utilities Company has been announced by R. P. Stacy, vice-president and general manager of the utilities company.

The conditions under which the sale was concluded are that the City Council shall grant a new franchise to the utilities company for the operation of the Greenmont-South Morgantown street car line and that this franchise be approved by the Public Service Commission. Mr. Stacey states that there is little doubt that a new franchise will be granted, since a gentlemen's agreement has been entered into before the negotiations were concluded. He declines to state the purchase price, further than to say "it was considerably higher than we anticipated and more than we felt we could afford to pay."

The transfer includes the 17-acre tract known as the Traction Park, the railway and the carhouse on the southern end of University Avenue. The transfer of the properties will not take place until Council has adopted a new franchise and it has been approved by the Public Service Commission.

Mr. Stacy states that while the details of the operation of the line remained to be worked out, his present intention is to operate the south Morgantown line and the Sabraton line as one.

The new franchise would lighten the present paving obligation.

Directors of Narragansett Company Oppose Merger Deal

No director of the Narragansett Electric Lighting Company, Providence, R. I., although each one is an owner of stock of the company in his own right, has seen fit to deposit his stock under the terms offered by the Rhode Island Public Service underwriters, according to a statement made by the N.E.L. board of directors in advising stockholders of the corporation not to deposit their stock under the merger offer.

The directors declare that the stock has an intrinsic value greater than that offered and they emphasize the point that the offer contemplates a deposit of stock without assurance of the deal going through. They point out that Narragansett stockholders lose their rights as stockholders upon deposit of their stock whether or not the transaction is completed.

The statement points out that although stockholders who deposit their stock under the plan give a control of their voting rights to the Service company underwriters, the plan may be altered in any respect the underwriters desired except as to the price of \$86 and may be carried through only as to the Narragansett and not with regard to the United Electric Railways or may be abandoned, and the stockholders have no voice in what is done whatsoever. Not even a definite date is fixed for the return of the stock to stockholders who deposit if the plan is abandoned, it is said.

Good Showing by Boston Elevated

At the close of the month of June and the eighth year of public trusteeship of the Boston Elevated Railway, Boston, Mass., the system not only emerges virtually without a deficit, but makes a further payment of \$22,304 to the cities and towns in the commonwealth that were placed under contribution by the Legislature to meet a deficit of \$3,980,151 in 1919.

In exact figures, the excess cost of service above receipts for the twelve months was \$10,054, against \$31,284 for the twelve months ended June 30, 1925.

The remitting of a check by General Manager Edward Dana on July 23 to the state treasurer makes the total repayments to the municipalities \$1,674,640 since the first one of \$517,196 in July, 1922. The repayment at this time last year was \$20,581, while the largest repayment was of \$1,114,557 in 1923.

Practically 70 per cent of the repayment goes to the city of Boston. The remainder is distributed among Cambridge, Somerville, Brookline, Medford, Malden, Everett, Watertown, Arlington, Chelsea, Newton and Belmont and to the commonwealth, which assumed the assessments of Quincy and Stoneham in 1919.

The total number of revenue passengers carried during the year was 368,932,079, almost 2,000,000 fewer than the preceding twelve months, but the total of passengers paying the full 10-cent fare was 303,148,232 in the year just ended, which was about 12,000,000 more than in the previous year. The total revenue from fares during the year that closed the end of last June was \$34,165,255, against \$33,444,502 during the year closing June 30, 1925.

In giving out the figures showing the financial results of operation during June and also during the twelve months including June, General Manager Edward Dana explained that but for an

item of snow-fighting last winter of almost \$500,000, the repayments to the cities and towns would have been very much increased. Last winter was exceptional. During a normal winter the cost of snow removal is usually somewhat less than \$100,000.

A graphic chart showing the allocation of the cost of service was prepared by General Auditor J. H. Moran for the twelvemonth. It showed that the average receipts from each revenue paying passenger were 9.511 cents. Almost exactly half of this, 4.753 cents, went for labor. The costs per passenger were divided thus: Labor, 4.753 cents; interest on bonds and notes, 0.687; rent of subways and tunnels, 0.600; rent of leased roads, 0.838; coal, 0.305; depreciation, 0.687; damages, 0.206; material and other items, 0.924; taxes, 0.439.

The largest item of expense in the

Three Miles of Westchester Line Abandoned

The Public Service Commission by order on Aug. 2 approved a declaration of abandonment by the Westchester Electric Railroad of that part of its line on the White Plains Road in the towns of Eastchester and Tuckahoe. The abandonment was occasioned by the fact that Main Street and Midland Avenue in Tuckahoe are to be paved, and due to the narrow streets and traffic congestion it was considered advisable to remove the tracks and substitute bus service. The estimated cost of the paving to the railway was \$8,000.

The company also granted a certificate to the Eastchester Transportation Company to operate a bus line in the territory which is now served by the railway. It will operate two 21-passen-

CHANGES IN THE BOSTON ELEVATED RESERVE FUND

Fiscal Year 1924-25			
July 1, 1924, \$1,000,000			
July.....	\$353,245.79*	Jan.....	\$269,649.08†
Aug.....	445,820.47*	Feb.....	118,183.05†
Sept.....	207,334.30*	Mar.....	211,955.71†
Oct.....	36,155.55*	April.....	130,636.68†
Nov.....	15,031.47†	May.....	139,081.44†
Dec.....	152,527.52†	June.....	25,792.94*
Profit and loss credit.....		\$51,865.43	

Fiscal Year 1925-26			
July 1, 1925, \$1,000,000			
July.....	\$249,477.93*	Jan.....	\$223,301.09†
Aug.....	367,593.94*	Feb.....	185,989.63*
Sept.....	176,763.97*	Mar.....	161,772.65†
Oct.....	117,703.96†	April.....	77,031.69†
Nov.....	45,265.00†	May.....	57,010.06†
Dec.....	289,347.71†	June.....	1,662.18*
Profit and loss credit.....		\$32,359.07	

* Excess of cost of service over revenue. † Excess of revenue over cost of service.

cost of service was \$11,777,399 for transportation expenses, which included wages of car service men. This was about \$17,000 more than the previous twelvemonth. There was no increase in the basic wage during the last year, merely a small increase in the differential paid to operators of one-man cars.

The total cost of service for the 12-month period was \$35,097,900, against total receipts of \$35,087,845. There were certain profit and loss credits which came to \$32,359 which enabled the repayment to the commonwealth and towns and left the sinking fund of \$1,000,000 intact.

ger buses on a fifteen-minute headway with a 10-cent fare and transfer privileges to the cars operated by the Westchester Electric Railroad and New York, Westchester & Connecticut Traction Company over their lines. The new company is a subsidiary of the Third Avenue Railroad, which operates other bus lines.

Before Commissioner Van Namee the company submitted figures covering yearly operations of its various properties since 1921. The loss in 1925 on the system was \$136,017 and for the first three months in 1926 the loss was \$30,924.



Financial Story of Boston Elevated Railway Under Public Control Told in Graphical Form

Suit to Foreclose Brought Against Massachusetts Road

The American Trust Company, Boston, Mass., has filed a bill in equity against the Milford & Uxbridge Street Railway, Milford, Mass., to foreclose a mortgage made by the Milford, Holliston & Framingham Street Railway in January, 1898, to secure a bond issue of \$180,000. The bill also asks for the appointment of a receiver to take over the property of the Milford & Uxbridge Railway. The Milford & Uxbridge company was organized and took control of the Milford, Holliston & Framingham Street Railway on July 10, 1902. The bond issue referred to in the petition was payable on Jan. 1, 1923.

Walter L. Adams, Milford, Mass., has since been appointed receiver for the Milford & Uxbridge company. He has been superintendent of road for many years. The appointment is the result of a bill in equity filed by the American Trust Company.

Balance in Fort Wayne Higher

For the year ended Dec. 31, 1925, the Indiana Service Corporation, Fort Wayne, Ind., reports a balance to surplus of \$179,940, against \$154,623 for the year 1924. Passengers carried on the company's transportation lines totaled 25,648,155, compared with 25,327,227 in 1924. Expenditures totaling \$1,814,766 were made during the year for additional plant and property needed to meet the development of the company's business. Approximately 6

INCOME ACCOUNT OF THE INDIANA SERVICE CORPORATION		
	1925	1924
Operating revenue.....	\$3,855,888	\$3,639,423
Operating expenses.....	2,537,961	2,577,996
Net operating revenue.....	\$1,317,927	\$1,061,427
Other charges, including taxes.....	263,587	245,659
Net operating income.....	\$1,054,339	\$815,767
Other income.....	13,844	.....
Total income.....	\$1,068,183	\$815,767
Interest on funded debt.....	719,799	661,145
Net income.....	\$348,383	\$154,622
Dividends declared.....	168,443	.....
Balance to surplus.....	\$179,940	\$154,622

miles of new track was laid, bringing the total length of track operated up to 242 miles. Fifteen new passenger cars were purchased, which gives the company a total of 176. The company sold \$1,229,110 of its preferred stock during the year under the customer-ownership plan.

Seattle Passes Railway Budget

Indicating possible net revenues of \$9,914, for next year's operation of the Seattle Municipal Railway the City Council has passed the railway budget, which had been reduced to \$5,733,805, against estimated receipts of \$5,752,725, leaving an estimated profit of \$18,919. City Treasurer Terry ordered the addition of \$9,000 to meet assessments against railway property.

D. W. Henderson, superintendent of railway, said that while the reduction in budget was heavy, the department would be able to proceed without cur-

tailing service. The total reduction was \$884,600, brought about by drastic cuts in expenditures for operating and maintenance. The budget as it now stands does not make allowance for any increase in wages, although increases which would total \$150,000 a year are being asked by trainmen, shopmen and track employees. The City Council took the stand that the budget must be kept within the estimated earnings for the coming year, even if it was necessary to curtail service.

Commission Asked to Approve Kansas City Transfer

Approval of the Public Service Commission for the formal transfer of the properties, franchises and other assets of the Kansas City Railways, now in the hands of receivers, to the Kansas City Public Service Company, is sought in an application filed on Aug. 6.

Bennett C. Clark, attorney for William G. Woolfolk, president of the Kansas City Public Service Company, filed the application.

The commission has not yet set a date for hearing of the proposal.

Securities for New Buses at Toledo Authorized

The Community Traction Company, Toledo, Ohio, has been authorized by the Ohio Public Utilities Commission to issue notes for \$99,952 to finance the purchase of new bus equipment for the Front Street line. No securities will be sold on the market. The buses are purchased under a lease-purchase plan. Twenty-four new buses are being purchased. Half are Mack chassis and half White chassis, both types fitted with Kuhlman bodies.

The new vehicles will go into operation within a few days to replace street cars.

Preferred Stock Called for Redemption

The first step in the proposed reorganization of the North American Light & Power Company, Chicago, Ill., in order to simplify its corporate structure was announced on July 30 with the calling for redemption on Oct. 1 of all of the company's \$4,307,800 of 7 per cent cumulative preferred stock at \$105 and accrued dividends.

Details of the proposed readjustment plan have since been revealed. This plan includes the issuance of \$15,000,000 of 30-year 5½ per cent debentures, and a block of new preferred stock. In this connection the North American Company and the Middle West Utilities Company will acquire a large portion of the common stock of the North American Light & Power Company.

Lines of the North American Light & Power Company's subsidiaries, including the Illinois Power & Light Corporation, will be interconnected with power lines of subsidiaries of the Middle West Utilities Company, with the possibility of certain interconnections with the North American Company's lines.

First Report of Engineers Public Service Company

A balance of \$2,528,971 available for reserves and for 777,979 common shares of stock was realized by the Engineers Public Service Company, New York, for the twelve-month period ended Feb. 28, 1926. This company recently acquired the Virginia Electric & Power Company, the Key West Electric, Eastern Texas Electric, El Paso Electric Company, and the Savannah Electric & Power Company.

The operations of the company's subsidiaries are supervised by Stone &

CONSOLIDATED INCOME STATEMENT OF THE ENGINEERS PUBLIC SERVICE COMPANY AND SUBSIDIARY COMPANIES

(Twelve Months Ended Feb. 28, 1926.)

Gross earnings.....	\$23,108,937
Expenses:	
Operation.....	\$10,377,083
Maintenance.....	2,186,596
Taxes.....	1,734,455
Total operating expenses and taxes.....	\$14,298,134
Net earnings.....	\$8,810,803
Interest, amortization and lease rentals.....	2,944,324
Balance.....	\$5,866,479
Dividends on preferred stock subsidiary companies.....	1,293,254
Balance for reserves and common stock.....	\$4,573,225
Deduct proportion of balance applicable to common stock of subsidiaries in hands of public.....	188,057
Balance applicable to reserves and to Engineers Public Service Company.....	\$4,385,168
Dividends on preferred stock of Engineers Public Service Company.....	1,856,197
Balance available for reserves and for 777,979 common shares of Engineers Public Service Company.....	\$2,528,971

Webster, Inc., as executive manager. It is the policy of the company to have its subsidiaries maintain adequate reserves for retirements and replacements and for other purposes. The combined reserves and surplus of the subsidiaries as of Feb. 28, 1926, amounted to 80 per cent of the annual gross earnings and 16 per cent of the book value of the properties. These statements were made in the first annual report of the company, which contains a record of activities for a portion of 1926 as well as for the six months of 1925, during which the company was in operation.

The accompanying income statement includes the operation of the five previously mentioned subsidiaries combined with the Engineers Public Service Company on the basis of its ownership or control of common stock as of April 12, 1926. It includes a full year's dividend on the preferred stock of the Engineers Public Service Company used in the acquisition of these subsidiaries' stocks, and also estimated operating expenses of the Engineers Public Service Company for a full twelve months.

No Par Value Stock Plan.—The Ninth Avenue Railroad, New York, N. Y., has filed a certificate in the office of the Secretary of State changing its capital stock from 8,000 shares \$100 par value to 8,000 shares of no par value.

Book Reviews

The A.B.C. of the Electric Car

By J. S. Dean, Westinghouse Technical Night School Press, 83 pages. Price 50 cents.

This is a neatly bound booklet setting forth in easily understandable language the elementary facts of electric railway operation. The text was first published as a series of articles in *Aera*, the official publication of the American Electric Railway Association. There appears to be real justification for the assertion of the publisher that the book contains just the information needed by many in the employ of electric railways who are either directly or indirectly concerned with the operation or maintenance of the electric car, but who have not had the advantage of a technical education and do not understand the fundamental principles of the electric motor or its operation. Numerous simple illustrations and the use of a water analogy successfully explain and make the subject clear.

Facts and Figures of the Automobile Industry

National Automobile Chamber of Commerce, New York, N. Y. 96 pages.

This annual review presents, in ready reference form, essential data on the development and present standing of motor transportation. Comparisons of production and registration between the United States and the rest of the world are shown graphically. Nearly five-sixths of the cars registered in the world are owned in the United States, and tables of this registration are given in detail. Much space is devoted to highway and traffic conditions, with maps and diagrams to illustrate regulations to avoid congestion. Statistics show the growth of the use of motor trucks and buses by both the steam railroads and the electric railways to supplement their service. The booklet uses 22 charts to make comparisons and analyses more striking, as well as numerous cartoons. Those interested in concise facts concerning the status of the automobile industry in 1925 will find information on every point from the raw material used in manufacturing to the licensing and registering of private motor cars.

Effect of Surface Materials on Steel Welding Rods

Prepared by the Research Bureau of the Chicago Steel & Wire Company, Bulletin No. 2.

A concise and accurate account of the manner in which steel welding rods are affected by materials adhering to their surfaces is given in this bulletin. The technical information contained therein on the subject of gas welding and metallic arc welding is sufficiently complete to meet the needs of practically any industrial welder and it is presented in a manner which is easy of comprehension.

After making a thorough investigation as to the effect of surface materials, it is the contention of the

Research Bureau that these substances, chiefly lime, iron oxide and copper, play a very important rôle in determining the quality of both gas and electric filler rods. For gas rods a clean metallic surface seems essential, while for metallic arc welding the presence of non-metallic materials on the surface is required. The statement is made that surface materials constitute the real difference between gas and electric filler rods.

In publishing its series of bulletins on fusion welding the Research Bureau of the Chicago Steel & Wire Company takes a broad general position with regard to the subject as a whole and no attempts to advertise the particular products of the company are made. Believing that the properties of welding rods are a considerable mystery to those concerned with welding and that much interest is centered around this subject, the Research Bureau publishes its findings as a contribution to the industry. It is undoubtedly true that lack of exact scientific knowledge regarding welding rods is probably holding back the expansion of welding in practically all cases of metal joinery. Booklet No. 2 deals in large part with figures and facts rather than theory.

Bothering Business

By H. A. Toulmin, Jr. B. C. Forbes Publishing Company, New York, N. Y. 57 pages.

Most men, according to Mr. Toulmin, who have had experience with the Federal Trade Commission are convinced that that body should be done away with entirely and at once. He, however, does not recommend a course so drastic, but, after listing the alleged chief faults of the commission, suggests a procedure that would make that body effective. The five chief faults of the commission are:

1. Giving widespread publicity to complaints before sufficient testimony has been taken.
2. Persisting in activities that the courts have already held to be illegal, and in prosecuting concerns for doing things that the courts have held to be legal.
3. Complicating the procedure unnecessarily.
4. Carrying on work that is properly the activity of some already existing government department.
5. Prosecuting and hearing cases that should be handled by the courts.

To do away with these evils, Mr. Toulmin advises that the commission cease making economic and statistical investigations, that it leave to other government departments and to the courts all cases that do not involve whole industries and broad principles of public welfare. In short, that it do only the work for which it was originally intended.

According to the author, conditions in the patent office do more to discourage invention than to help it. Such long delays are frequently met on application for a patent that a concern may starve to death while waiting to manufacture some article that would have saved its life. On the other hand, patents are at times granted without suf-

ficient investigation having been made so that a manufacturer may find he is violating the rights of a previous holder of a patent after he has made a considerable expenditure of time and expense. To combat these conditions Mr. Toulmin would, in the first place, have Congress appropriate considerably more money for the patent office, to give it better quarters, increase the number of employees and increase their salaries; then the methods within the department should be improved and simplified so that engineers and lawyers could use the files for investigation and study, and thereby guard against duplication.

Can We Compete Abroad?

By C. C. Martin. National Foreign Trade Council. New York, N. Y. 155 pages.

Actual experience and practice are narrated in this book, which answers the title question by quoting the opinions of the traders of other countries. It does not attempt to discuss the technical or economic problems of foreign trade. The stories and comments are taken from foreign consular reports and foreign trade journals, from speeches, interviews, confidential reports and the debates of foreign parliaments. They indicate that the American trader makes a greater effort to study the conditions and requirements of the country in which he wishes to sell his goods than do his competitors.

Analyses made of trade reports indicate fuller co-operation between the manufacturing plant and the American salesman, so that where speed in filling an order is a determining factor he has an advantage. Just as advertising is carried on much more extensively and elaborately in the United States than in any other country, the American manufacturer has advertised his goods more widely in foreign countries than others; he makes a greater effort to create a demand. Not so many years ago the American manufacturer believed that it would be impossible for him to compete with the lower wages and cost of production abroad, but now American products are known throughout the world, American business methods are approved and adopted on every hand and American capital is invested in every country.

In conclusion, Mr. Martin says: "Though we wish and shall have our fair share of world trade, we do not wish a share that will deprive others of what they need and should have. Our trade flourishes as much by selling to countries which are our competitors as by selling those who do not compete with us; England is our chief competitor and our largest overseas customer. These countries need foreign trade as much as we. A monopoly of world trade for us would be an unmixed disaster."

Mr. Martin is well known as a writer and speaker on foreign trade. He has been actively engaged in business in every country of western Europe and has traveled extensively in Latin America and elsewhere. He has contributed widely in United States and Europe to economic and financial publications, and his book on "Packing for Export" is a standard work on the subject.

Personal Items

G. D. Nicoll, General Superintendent Ohio Interurban

G. D. Nicoll, recently appointed general superintendent of the Indiana, Columbus & Eastern Traction Company, with headquarters in Springfield, Ohio, has been engaged in electric transportation work since his school-days were completed. Since his latest traction advancement, he has also been named general superintendent of the Dayton & Columbus Transportation Company, the bus subsidiary of the railway.

Mr. Nicoll was born in Iowa and spent his early boyhood in that state. After leaving school, he entered the transportation field in a minor capacity in Illinois. He was quick to seize opportunity and his progress was rapid. He engaged in railway work in New York, Indiana and Pennsylvania suc-



G. D. Nicoll © Redmon

cessively and entered similar work in Ohio for the first time in 1911, when he was appointed superintendent at Zanesville of the former Ohio Electric Railway. Six years later he was transferred by the company to Dayton. There he served as superintendent until 1918, when he removed to Springfield to become assistant chief engineer. A few years later the Ohio Electric Railway system was dissolved, but Mr. Nicoll remained with the Indiana, Columbus & Eastern Company as assistant chief engineer, the latter having been a part of the Ohio Electric system.

He was promoted to chief engineer by the company in 1922 and retained this post until he was named general superintendent of the company on July 1 of the present year.

Brooklyn Official Advanced

James C. Hunter, who was acting division superintendent at the East New York depot of the Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., since last December, has been appointed division superintendent in charge of that depot by William Siebert, superintendent of surface transportation. He

succeeds the late Charles V. Hogberg. Mr. Hunter was appointed a conductor on Feb. 21, 1905, at the Canarsie depot. Three years later he was transferred to night transfer clerk, but after five months returned to his run as a conductor. A short time later he was appointed extra inspector and from that time advanced steadily through the various grades in the operating department to his present one. Before going to East New York during the absence of Mr. Hogberg because of illness, Mr. Hunter was supervisor of revenue inspectors for five years. He is 42 years old.

F. L. Blanchard Heads Utilities Advertising Association

Frank Leroy Blanchard is the new president of the Public Utilities Advertising Association. He is often spoken of as "the dean" of American advertising, owing to his long service and experience in this field. After graduating from Bates College, Mr. Blanchard received his first assignment as a reporter on the New York *Tribune*. He soon progressed to the city editor's desk on the New York *Morning Telegraph*, and then for two years was assistant editor of the *Evening Telegram*. The *Evening World* then received the benefit of his abilities, and for three years he remained on the editorial staff of this newspaper, nearly a world's endurance record, as reporters' jobs went in those days.

It was after his connection with the *World* that Mr. Blanchard launched the *Editor and Publisher* for J. B. Shale, then president of the Publishers' Press Association. Mr. Blanchard was its first editor, a position he held until the advertising field attracted his attention.

Mr. Blanchard's entrance into advertising was through the Hampton and Seaman agencies. He early became a student of advertising as well as a practical advertising man and his thoughtful articles in advertising periodicals attracted wide attention among business men. He soon accepted an offer to become managing editor of *Printers' Ink*.

Probably Mr. Blanchard's greatest single contribution to the cause of advertising was his inauguration, in 1904, of the first oral course in advertising to be established anywhere in the world. This course was held, and continues to be held, at the Twenty-third Street Y. M. C. A. For twenty years Mr. Blanchard actively directed its destinies.

Mr. Blanchard's standing in the advertising field brought him to the attention of Henry L. Doherty, who invited him to enter the Doherty organization in 1922 as director of public relations for the utility and oil properties of the Cities Service Company. At that time, too, he became one of the charter members of the Public Utilities Advertising Association.

Since his connection with Mr.

Doherty, Mr. Blanchard has been active in all branches of public utility advertising work. He is a member of the Advertising Commission of the International Advertising Association, chairman of the publicity and advertising section of the American Gas Association, and is a member of similar committees in the American Electric Railway Association, the National Electric Light Association, and the Society for Electrical Development.

G. W. Kalweit, Milwaukee Auditor, with Holding Company

George W. Kalweit has resigned as general auditor of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to join forces with W. N. Albertson as vice-president and treasurer of the newly organized Central West Public Service Company. He is especially well fitted to perform the duties required in his new work by his long and broad experience in the field of accounting, to which end of the business practically his entire business career has been devoted.

Mr. Kalweit was born in Germany in



G. W. Kalweit

1880 and came to the United States with his parents as an immigrant at the age of six years, settling in Milwaukee. Upon completion of his education in the schools of Milwaukee his first position was that of office boy with the Milwaukee Electric Railway & Light Company, the service of which he entered Jan. 31, 1898. By January, 1904, he had worked his way up to the title of assistant bookkeeper. On March 26, 1906, he was advanced to the post of acting auditor and then to auditor on Jan. 1, 1907. He continued as auditor until March 1, 1916, when he was appointed general auditor of the Milwaukee Electric Railway & Light Company, which office he filled until he resigned to take over his new duties with the Milwaukee holding company.

In addition to his other duties, Mr. Kalweit figured prominently in the organization of the Employees' Mutual Benefit Association of the Milwaukee Electric Railway & Light Company, formed in 1912 for the purpose of amicably adjusting differences which arose from time to time between company and employee. He was director and general auditor of this association until 1921.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Brake Shoe Does Well During First Six Months

American Brake Shoe & Foundry Company has enjoyed a half year of considerable prosperity, according to the *Wall Street Journal*. There seem to be good possibilities that the net for the year will considerably surpass the \$13.57 share earned on the 156,093 common shares of the company stock in 1925. The paper goes on to state:

Brake Shoe has a consistent and excellent earning record. In 1923 the net per common share was \$13.35, in 1924 it was \$11.36 and the average for the past three years is \$12.79.

In view of this steady earning power if 1926 earnings come up to present indications it is likely the directors will declare something special in the way of dividends at the December meeting. The company could easily pay a 50 per cent stock dividend and maintain the present rate of \$6 on the new stock. The 156,093 common shares are carried at \$7,880,650, or \$50 a share, and the surplus at the close of last year stood at \$8,119,314. However, the question of dividends has not yet been considered by the board and any suggestions at present as to the December possibilities must be somewhat in the nature of conjecture.

Standardization Movement Shows Healthy Growth

Representative trends toward standardization of industrial products have been considerably extended during the past year and savings from standardization work are constantly growing in magnitude, according to the Year Book of the American Engineering Standards Committee, just issued. More than 200 definite standardization projects are in process or completed under the auspices of the A.E.S.C., and 365 national trade associations, technical societies and government bureaus are co-operating in the work.

The standardization of drafting room practice and of methods of graphically presenting facts are two projects of interest which will be undertaken by a committee of experts that will shortly be organized. Much work has been done during the past year in establishing a comprehensive system of limit

gaging, which, if generally adopted, can produce savings for American industry approaching a billion dollars a year, it was stated.

U. S. Steel Tells About Its Personnel Work

A comprehensive picture of the work which has been done by the United States Steel Corporation in furthering

the welfare of its employees is given in a profusely illustrated booklet just issued to commemorate the 25th anniversary of the founding of the corporation.

All manner of subjects relating to employee problems are pictured and many ideas may be obtained, in looking over this book, for personnel work in other types of industry. A few pages of historical information is given on the astonishing progress which has been made by the United States Steel Corporation since its inception, and there is also included a letter from James J. Davis, Secretary of the Department of Labor, complimenting Judge E. H. Gary upon the excellent records which have been made in the matter of accident prevention and safety work in the intensive campaign carried on by the company.

Comprehensive Tests Being Given Two-Car Trains in Twin Cities



Interior of the New Twin City Car, Showing Type of Lighting Fixtures Used

As was briefly stated in the issue of *ELECTRIC RAILWAY JOURNAL* for Aug. 7, the streets of Minneapolis and St. Paul, Minn., are being used as laboratories for the testing of a two-car train unit recently constructed by the Twin City Rapid Transit Company. It is desired by the company to know how effectively the double unit may be employed in handling the peculiar rush-

hour traffic problems which are encountered in the communities which it serves.

A number of unusual features are embodied in the construction of the trial cars. The lighting fixtures shown in the accompanying interior view provide an exceptionally good illumination and the extra window space also adds to the brightness of the cars.



Two-Car Train Now Being Operated by the Twin City Company to Determine Its Feasibility for Permanent Adoption

Bus Business Normal, Mack Official Declares

Bus production, delivery and demand are equal to last year, indicating that the business has become stabilized and settled down to a normal basis, according to Roy A. Hauer, manager of the general bus department, Mack Trucks, Inc., New York City. This assertion was based on business statistics compiled in the several divisions of the Mack organization. Mr. Hauer declared that the Mack company has added nineteen traction companies and sixteen railroads to its business list since last year, indicating that traction and steam railroad companies are realizing more fully today than ever before the economic status of the bus in transportation systems, not only as an auxiliary service, but for complete co-ordination with fixed lines of transit.

Rolling Stock

Indiana Service Corporation, Fort Wayne, Ind., recently received five interurban motor passenger cars and two combination buffet and parlor cars, also for interurban service, from the St. Louis Car Company, St. Louis, Mo. The order for these units was placed in September, 1925. The seating capacity of the straight passenger cars is 50, while the parlor-buffet will accommodate 29 passengers.

Specifications on the passenger cars are given herewith:

Weight:	
Car body	59,000 lb.
Trucks	27,000 lb.
Equipment	14,000 lb.
Total	100,000 lb.
Booster centers	38 ft. 6 in.
Length over all	61 ft. 6 in.
Truck wheelbase	7 ft. 0 in.
Width over all	8 ft. 9 in.
Height, rail to trolley base	12 ft. 10 in.
Body	All steel
Interior trim	Steel, mahogany finish
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Sleeve type
Axles	Standard Steel Co., heat treated
Bumpers	12-in. channel with Hedley anti-climbers
Car signal system	Consolidated
Car trimmings	St. Louis Car
Center and side bearings	Stucki-Roller side and Baldwin center
Compressors	General Electric
Conduits and junction boxes	Crouse-Hinds
Control	Westinghouse HL
Couplers	Tomlinson No. 13
Curtain fixtures	Railway Supply & Curtain Co.
Curtain material	Pantasote
Destination signs	Hunter
Fenders	Steel pilots
Finish	Pratt & Lambert Vitralite enamel
Gears and pinions	Nuttall, grade B, helical
Heater equipment	Peter Smith hot water No. QC2 and Railway Utility electric
Headlights	Golden Glow
Journal bearings	Standard M-C-B
Journal boxes	Symington
Lightning arresters	Westinghouse, condenser type
Motors	Four Westinghouse 333 VV6, inside hung
Sanders	Knight pneumatic
Sash fixtures	O. M. Edwards
Seats	St. Louis Car Co.
Seating material	Mohair, striped plush and leather
Springs	Standard Steel Works
Step treads	Feralun
Trolley retrievers	No. 5 Knutson
Trolley base	U. S. No. 13
Trucks	Baldwin 5½-in. x 10-in. journals
Ventilators	Railway Utility
Wheels	Standard Steel 37 in.

Special devices, etc. 1.5 kw. motor-generator set with 200 amp.-hr. battery for 32-volt lighting system
Energy-saving device.....Economy meters

Data on the parlor-buffet cars is also appended:

Weight:	
Car body	57,000 lb.
Trucks	27,000 lb.
Equipment	7,000 lb.
Total	91,000 lb.
Booster centers, length	38 ft. 6 in.
Length over all	61 ft. 6 in.
Truck wheelbase	7 ft. 0 in.
Width over all	8 ft. 9 in.
Height, rail to trolley base	12 ft. 10 in.
Body	All steel
Interior trim	Steel, enamel finish
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Sleeve type
Axles	Standard Steel Co., heat treated
Bumpers	12-in. channel with Hedley anti-climbers
Car signal system	Consolidated
Car trimmings	St. Louis Car
Center and side bearings	Stucki-Roller, side and Baldwin, center
Compressors	General Electric
Conduits and junction boxes	Crouse-Hinds
Control	Westinghouse HL
Couplers	Tomlinson No. 13
Curtain fixtures	Railway Supply & Curtain Co.
Curtain material	Pantasote
Finish	Pratt & Lambert vitralite enamel
Gears and pinions	Helical
Hand brakes	None
Heater equipment	No. 5-H Arcola hot water and Railway Utility electric
Headlights	Golden Glow
Journal bearings	Standard M-C-B
Journal boxes	Symington
Lightning arresters	Westinghouse, condenser type
Motors	Two Westinghouse 333 VV6, inside hung
Sanders	Knight pneumatic
Sash fixtures	O. M. Edwards
Seats	Club chairs
Seating material	Spanish crush gray leather
Springs	Standard Steel Works
Step treads	Feralun
Trolley retrievers	No. 5 Knutson
Trolley base	U. S. No. 13
Trucks	Baldwin 5½-in. x 10-in. journal
Ventilators	Railway Utility
Wheels	Standard Steel 37 in.
Special devices, etc. 1.5 kw. motor-generator set with 200 amp.-hr. battery for 32-volt lighting system	
Energy-saving device	Economy meters

Iowa Public Utilities Company, Centerville, Iowa, operating the Ottumwa Street Railway, Ottumwa, Iowa, has purchased three 25-passenger Mack city type buses, to replace street cars operating in that community.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., has ordered ten two-section articulated motor trains of the de luxe type. These will be operated on the route between Baltimore and Washington. The order has been placed with the J. G. Brill

Metal, Coal and Material Prices

Metal—New York	Aug. 10, 1926
Copper, electrolytic, cents per lb.	14.45
Copper wire, cents per lb.	16.25
Lead, cents per lb.	8.925
Zinc, cents per lb.	7.65
Tin, Straits, cents per lb.	65.875
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$5.075
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.50
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb	12.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.50
Turpentine (bbl. lots), N. Y., per gal.	\$1.04

Company. The Maryland Public Service Commission has approved an application made by the company to enter into the contract for the new equipment, which is to cost about \$400,000. Authority also has been granted by the commission for the railroad to issue 120 lease warrants with a total face value of \$468,900.

Butte Electric Railway, Butte, Mont., has ordered a street car type Fageol bus, equipped with air brakes, for city operation.

Union Traction Company of Indiana, Anderson, Ind., has filed a petition through its receivers for authority to buy 20 freight cars at a cost of \$3,000 each. Authority to proceed with the purchase was given by the court. A report on freight traffic showed that receipts from that source in 1925 were \$681,288, and in the first four months of 1926 the freight traffic income was \$207,161. It was stated that the Union Traction Company could increase its freight receipts if it had more cars. The terms of purchase on the freight cars, which will be of the standardized design adopted some time ago by the Central Electric Railway Master Mechanics' Association, are one-third payment on delivery and the balance in monthly installments.

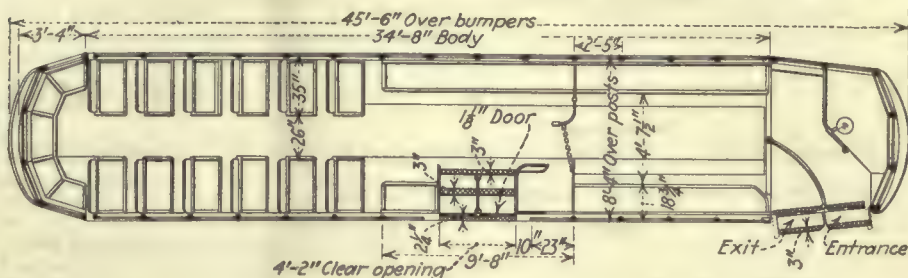
Scranton Railway, Scranton, Pa., will spend approximately \$250,000 for the purchase of twelve new cars and the rebuilding of ten others. Each new car will cost \$17,000 and the improvements to the old cars will amount to about \$45,000. The new equipment, which will be ready by December, will make it possible to operate one-man cars on all urban routes.

Trade Notes

American Brown Boveri Corporation, New York, N. Y., has opened a district sales office in Philadelphia, Pa., at 922 Witherspoon Building. Louis T. Peck will be in charge of this office.

Graybar Electric Company, Inc., New York, N. Y., announces the consolidation of its three New York City offices, to be located in the largest office building above ground in the world. The structure will be known as the Graybar Building and is being erected at Lexington Avenue and 43d Street. The fifteenth floor will be devoted almost exclusively to private offices for executives of the company.

State Law Reporting Company, 233 Broadway, New York City, has twenty field offices, from each of which shorthand reporters are sent out to cover hearings of the Interstate Commerce Commission. It furnishes the only official report of the commission proceedings under terms fixed by the commission. The official minutes of the present bus investigation, therefore, are available to those who wish to secure them. These hearings, to which reference has been made before in the ELECTRIC RAILWAY JOURNAL, are scheduled to take place at thirteen different points in the United States, with the concluding hearing at Washington, D. C., on Sept. 29.



Fifty more modern cars for P.R.T. —equipped with Peacock Staffless

In order to handle the greatly increased traffic due to the Sesqui-Centennial Exposition, the Philadelphia Rapid Transit Company recently received fifty more modern cars.

And of course they're equipped with modern hand brakes—Peacock Staffless Brakes!

Their almost unlimited chain-winding capacity, high-braking power, light weight and space-saving dimensions make these brakes adaptable for all types of service.

Ask for installation estimates on your requirements.

National Brake Co., Inc.

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When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

ACME Window Curtain Fixtures

Noiseless — direct acting — enlarged friction surface — less parts — stronger — more easily and finely adjusted.

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A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we build. That's why so many electric railway men rely absolutely on our name.

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FORGED STEEL AXLES

For Locomotives, Passenger, Freight and Electric Cars
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Portablc Arc Welding Outfits
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Cleveland, Ohio

ROEBLING

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ELECTRICAL WIRES and CABLES

John A. Roebling's Sons Company, Trenton, N. J.

Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the alphabetical index.



Be Sure of Customer Confidence

The average man who rides on a street car has never entirely forgotten that famous and unfortunate "The public be damned."

It is true that unfailing service at low cost, public spirited policies, and immense contributions to comfort and convenience on the part of electric light and other utility companies have pushed the recollection farther and farther back into his memory. But it is there to crop out when any controversy with the public arises.

Whether this controversy arises from rate adjustments, merger, purchase or sale, reorganization, extensions or what not, the goodwill and fair judgment of the public can be won by a full presentation of the facts—by laying all the cards on the table.

One of the most important of these cards can be a valuation and rate study by The American Appraisal Company. It can be proved correct. It is known to be disinterested. It will find many of your important citizens welcoming it in the light of their own experience with our appraisals.

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Flexibility

Satisfactory service requires smaller coaches in larger numbers, rather than fewer units of the more cumbersome type.

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In addition Graham Brothers Coaches, by their attractive appearance, invite patronage and operate at minimum cost.

21 Passenger Street Car Type Motor Coach Complete

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Bucket type Leather-Upholstered Seats Being tried by Cleveland Railway.

Nothing takes the place of
LEATHER



Seating arrangement of a Standard Trailer car used in Cleveland.

Which do you prefer?

On a recent experiment by the Cleveland Railway of running a new type of car equipped with leather-upholstered seats, people let the old type of cars pass them up and waited for the car with the comfortable seats.

There is nothing like comfortable seats for selling rides and nothing can take the place of leather covering for durability, maintenance and comfort.

We offer complete hides or will cut them to pattern if you submit paper templets. Samples gladly sent upon request.

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Initial investment in the Reo Chair Coach is moderate.

Dependability is assured by quality materials, rigid inspection, extra hardy vital parts and a careful consideration of all important factors necessary to superior bus performance.

Service is available in nearly 2000 cities and Reo parts are reasonably priced.

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No other bus combines these features
of the Reo Model "W"

Six Cylinder Engine
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Sub-Frame
Standard Tread
163 Drop Forgings
Four-Wheel Brakes

Standardized Bodies
Service in nearly 2000
cities
Low-Priced Repair Parts
Accessibility of all Units



Smooth Braking Helps Create and Conserve Bus Revenues

People would rather ride on buses that stop smoothly and comfortably, and drivers would rather operate them.

Such buses last longer. So do their tires. Jerky, "grabby" stops are rough on a bus chassis, they rack the body and unduly wear and strain the tires.

These are some of our reasons for strongly recommending hard fibre liners with Christensen Air Brakes. The shortest possible stop is made comfortably and with less strain upon the vehicle.

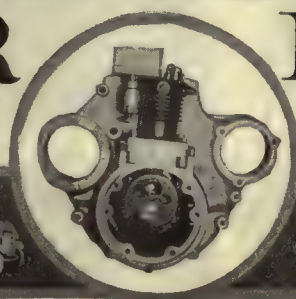
In the end the operator profits from more patronage and less maintenance cost.

The liner and drum combination that our extensive road tests have led us to recommend, together with the self-equalizing feature of Christensen Air Brakes, give attention-free brake mileage that every operator of buses could profitably use. The information is yours upon request.

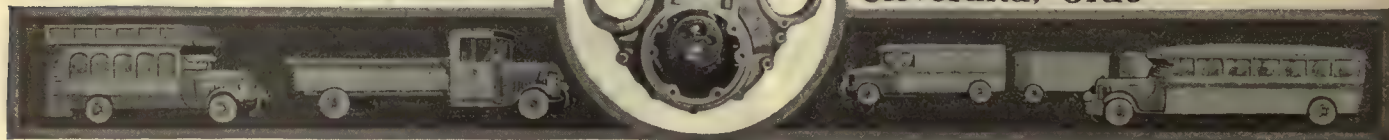
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AIR BRAKE CO.,
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A passenger in the bus
is worth *ten* on the curb!—



The inviting entrance of a Lang Body helps secure a quick load. Sightseers are drawn toward the open roof which distinguishes this model. For every type of service, Lang engineering skill creates an atmosphere of comfort and luxury which helps build revenue.

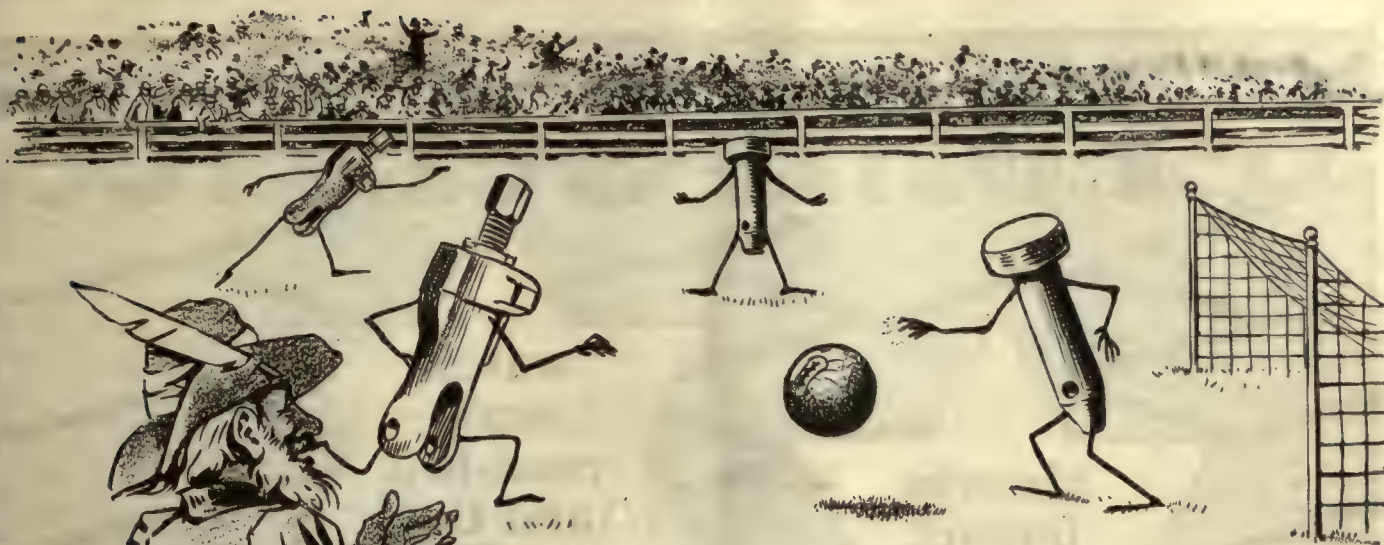
THE LANG BODY COMPANY • CLEVELAND, OHIO

LANG BODIES

create new passengers



*"After all—
it's the Setting
that counts!"*



A real test of endurance from start to finish—

From the opening whistle to the closing one there's no time to rest in a fast game of soccer. Following the ball up and down, back and forth is a severe test of endurance. Sudden starts, stops and hard knocks are part of the game—which means that the players must always be in first class condition.

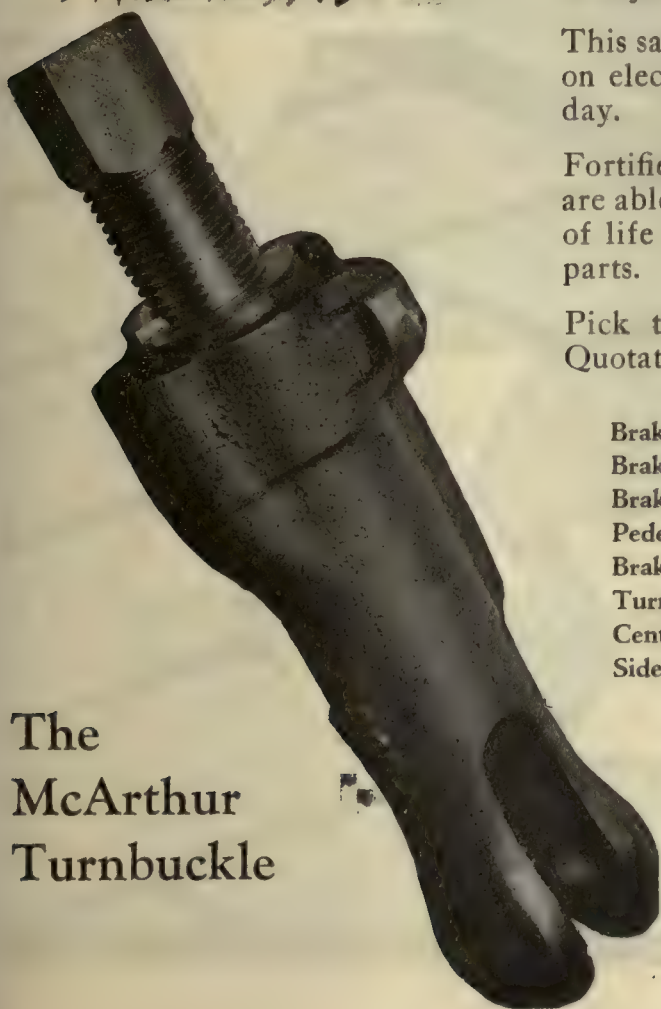
This same test of endurance applies to brake equipment on electric cars—where hard usage is the order of the day.

Fortified by the Boyerizing Process, Boyerized Parts are able to stand the most rigorous service—their length of life being three to four times that of ordinary steel parts.

Pick the parts you need from those given below. Quotations on request.

Brake Pins	Spring Post Bushings
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at rail
joints**

**water-
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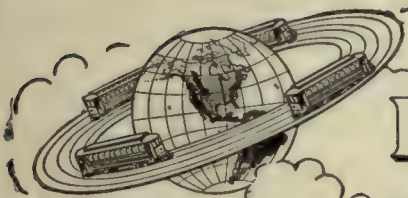
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expansion
and
contraction**

**practically
100%
salvage
value**

**resists
heaviest
traffic**

**is easily
removable
for track
repairs**

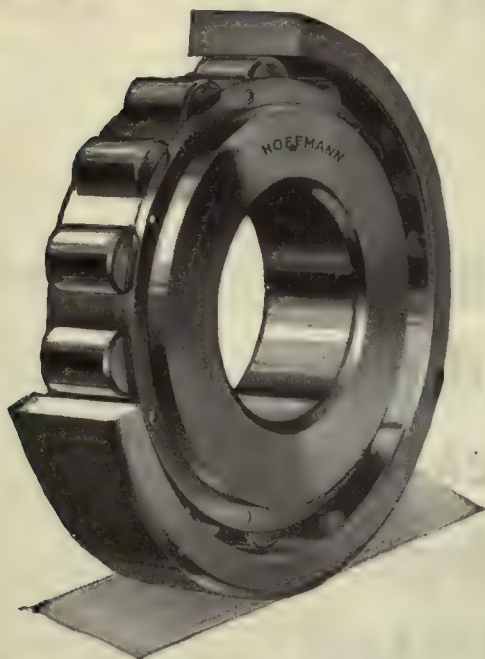
The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

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A steady load capacity at least twice that of any ball bearing of the same size; a temporary overload capacity of at least 50 per cent; a tremendous ability to resist shock, jar and vibration; solid cylindrical rollers of hardened alloy steel; balanced, self-supporting roller cage; precision of dimension and finish carried to the extreme of refinement; these are the factors which give the "Hoffmann" its unequalled depend-ability at all speeds.—Write for Catalog 904.

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PRECISION BALL, ROLLER AND THRUST BEARINGS

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What Nuttall BP Gears can do for you!



The BP Treatment Triples Impact Resistance

Sudden shocks that will break untreated gears will not break BP gears because the BP Treatment toughens the steel and triples its impact resistance.

R.D. NUTTALL COMPANY
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View of 20th Century rounding bend at Marblehead. The New York Central is always among the leaders in modern equipment. Insert shows our type CPO1 Bond used on all main line tracks

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The American Steel and Wire Company has a rail bond for every requirement. Our engineers will be glad to assist you in selecting the best bond for your needs.



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Safety demands that every car or bus be equipped with Pyrene. The riding public expect and are entitled to the protection from fire which this extinguisher assures.

Aside from the protection from fire afforded by such installation, to both rolling stock, operator and passengers, the schedule of the Central Traction and Lighting Bureau specifies a charge of 5¢ on motor buses, 3¢ on interurban and 1¢ on urban cars, for the absence of fire extinguishers.



The slight outlay involved by having rolling stock equipped with an improved Pyrene one quart extinguisher should be regarded as an investment—a device that helps make safety from fire certain should be popular.

Safety adds to the revenue of the operating company by inspiring confidence in the riding public toward modern transportation.

Many of the leading Public Service Corporations recognize this and have equipped their cars and buses with Pyrene extinguishers—they know a burning car or bus need not be abandoned if PYRENE is at hand.

For the protection of electrical equipment, power houses, car barns, shops and storerooms PYRENE 1½ quart extinguishers are dependable in every emergency.

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NEWARK, N. J.

"Fortify for Fire Fighting"



Cold Dinners

for *your* passengers?

Not if you use

AJAX
BABBITT for ARMATURES

keeps the rolling stock rolling



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Established 1880

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Seat and Curtain Materials

There is no substitute for Pantasote

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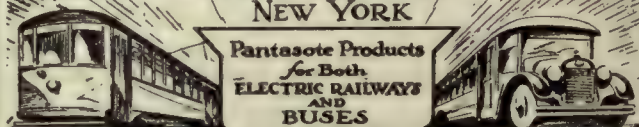
Roofing—Headlining—Wainscoting

The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th Street
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NEW YORK



The 1926 Edition McGRAW Electric Railway Directory

The time your salesmen can
save would pay for it
many times

"Who are the men I should talk to in the
Blank Railway Company?"

You'll find the answer quickly in the
1926 Edition McGraw Electric Railway
Directory. Keep a copy handy—in your
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Call on the right men—the men who
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wide territories, they can't be expected
to know all the changes in personnel of
the roads they call on.

Our records showed 65% in changes since
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And your mailing list. Why not *know*
in advance that you are reaching the men
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Don't waste valuable time and effort in
a \$300,000,000 market by misdirecting
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Here are the inside facts

- 1—Complete list of every recorded electric
railway company in the United States,
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- 2—Names and addresses of officials, superin-
tendents, department heads and purchas-
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- 3—Addresses of companies operating buses.
- 4—Addresses of repair shops.
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- 6—Number and kinds of cars used.
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Price \$7.50 a Copy

10% discount for five or more

DIRECTORY DEPARTMENT, ELECTRIC RAILWAY JOURNAL,
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Gentlemen:—Will you please send me:

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The methods, aims, developments and
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This new book—just published, is the work of the man
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Mr. Murray starts with the conditions and methods of
today and carries them forward to their ultimate and
logical conclusion.

Superpower

Its Genesis and Future

By William Spencer Murray, of Murray and Flood,
Engineers

237 pages, 6x9, 25 diagrams, \$3.00

Here is the complete book on superpower—an interesting,
authoritative account of the whole program from the
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sibilities and limitations. William S. Murray, the founder
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of SUPERPOWER, as practiced and planned, and shows
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of accomplishment is startling yet indicative of what may
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basically sound in its every phase, fundamentally desir-
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A few of the facts explained

- Mr. Murray discusses clearly such questions as:
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Examine the book for 10 days FREE

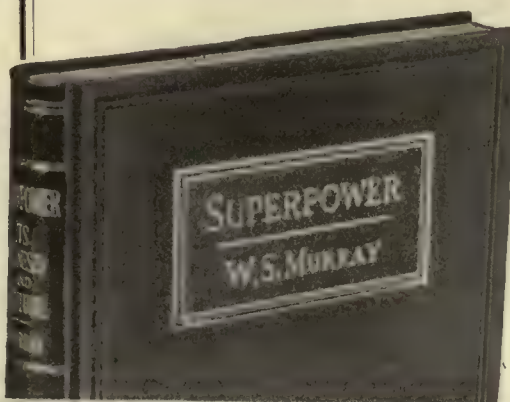
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St. Louis, Mo.

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You're having brush trouble

**CORRECT IT
USE LE CARBONE CARBON BRUSHES**

They talk for themselves

**COST MORE PER BRUSH
COST LESS PER CAR MILE**

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in a half-century of
continuous production,
has spun out a record
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unequalled in the
history of insulated
wires and cables

THE KERITE INSULATED WIRE & CABLE COMPANY INC.
NEW YORK CHICAGO



from Wintry Canada

Regardless of Climate, Dayton Mechanical Ties Reduce Track Repairs

THE weather—the destructive action of King Frost—is blamed for a great deal in track repairs. But is King Frost as bad as he is painted?

Experience with Dayton Mechanical Ties indicates otherwise. We have sold them to be installed everywhere from wintry Canada to semi-tropical Texas. Daytons in service are subject to every kind of climate between the two extremes—including the alternate frost and thaw of the middle latitudes. There is no perceptible difference in their durability under these varying conditions.

We are forced to the belief that it is not the frost, but the uncushioned vibration which occurs in ordinary

track construction which disintegrates the concrete ballast. Concrete will bear heavy constant loads, but fails under vibration. Dayton Mechanical Ties, by providing just enough resilience, absorbs the vibration, and preserves the concrete.

We cannot tell you how long Dayton-laid track will last. 10-12 years of heavy traffic leaves it unimpaired—apparently ready for 10 or 12 years more. Maintenance is insignificant.

The resilience also cuts rolling stock repairs, and makes easier, more quiet riding.

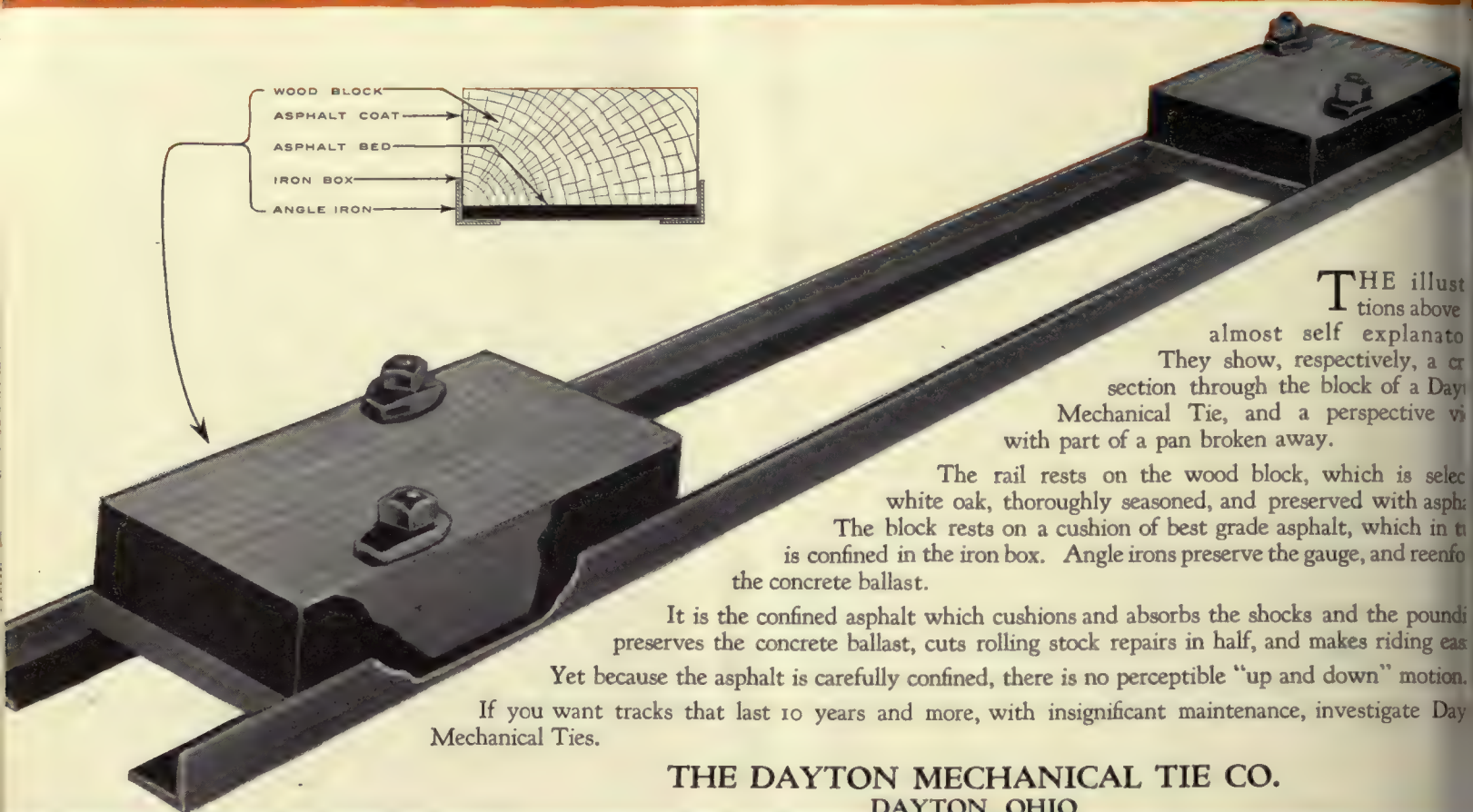
Investigate Dayton Mechanical Ties. They cost less than wood ties and last far longer. Write for complete data.

THE DAYTON MECHANICAL TIE CO.
DAYTON, OHIO



to
Sunny Texas

Explaining why Dayton Mechanical Ties are Resilient.



THE illustrations above almost self explanatory. They show, respectively, a cross section through the block of a Dayton Mechanical Tie, and a perspective view with part of a rail broken away.

The rail rests on the wood block, which is selected white oak, thoroughly seasoned, and preserved with asphalt. The block rests on a cushion of best grade asphalt, which in turn is confined in the iron box. Angle irons preserve the gauge, and reinforce the concrete ballast.

It is the confined asphalt which cushions and absorbs the shocks and the pounding, preserves the concrete ballast, cuts rolling stock repairs in half, and makes riding easy. Yet because the asphalt is carefully confined, there is no perceptible "up and down" motion.

If you want tracks that last 10 years and more, with insignificant maintenance, investigate Dayton Mechanical Ties.

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DAYTON, OHIO

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"Searchlight" Advertising

G-1

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(Continued on page 48)

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(See Rail Joints)
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(See also Headlights)
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Wm. Wharton, Jr. & Co.
- Manganese Steel Switches, Frogs & Crossings
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Graybar Electric Co.
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- Omnibuses (See Buses, Motor)
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Ohio Brass Co.
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Westinghouse Tr. Brake Co.
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- Plates for Tee Rail Switches
Ramapo Ajax Corp.
- Pliers, Rubber Insulated
Elec. Service Sup. Co.
Nat'l Ry. Appliance Co.
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Ohio Brass Co.
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Hubbard & Co.
- Poles, Metal Street
Elec. Ry. Equipment Co.
Graybar Electric Co.
Hubbard & Co.
- Poles and Ties Treated
Bell Lumber Co.
- Poles, Ties, Posts, Piling and Lumber
Bell Lumber Co.
Naugle Pole & Tie Co.
- Poles, Trolley
Bell Lumber Co.
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Elec. Service Supplies Co.
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Buda Co.
- Postheads
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Okonite-Callender Cable Co., Inc.
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National Ry. Appliance Co.
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- Rail Filler
Philip Carey Co., The
- Rail Grinders (See Grinders)
- Rail Joints
Carnegie Steel Co.
Rail Joint Co., The
- Rail Joints-Welded
Lorain Steel Co.
Metal & Thermit Corp.
- Rail Welding
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
- Rails, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
- Rail Welding
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
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St. Louis Car Co.
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International Register Co.
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- Reinforcement, Concrete
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Bethlehem Steel Co.
Carnegie Steel Co.
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Elec. Service Supplies Co.
- Repair Work (See also Coils)
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Elec. Service Supplies Co.
- Resistances
Consolidated Car Heating Co.
- Resistance, Wire and Tube
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General Electric Co.
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- Rheostats
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Westinghouse E. & M. Co.
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Pantasote Co., Inc.
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St. Louis Car Co.
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Hale-Kilburn Co.
St. Louis Car Co.
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- Shovels
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Hubbard & Co.
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- Splicing Sleeves (See Clamps and Connectors)
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- Strain Insulators
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Ohio Brass Co.
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- Strand
American Steel & Wire Co.
Roebbling's Sons Co., J. A.
- Street Cars (See Cars, Passenger, Freight, Express)
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General Electric Co.
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- Switches, Track (See Track Special Work)
- Tampers, Tie
Railway Trackwork Co.
- Tapes and Cloths (See Insulating Cloth, Paper and Tape)
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Graybar Electric Co.
- Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)
- Thermistats
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Railway Utility Co.
Smith Heater Co., Peter
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Ties and Tie Rods, Steel
Carnegie Steel Co.
International Steel Tie Co.
- Ties, Mechanical
Dayton Mechanical Tie Co.
- Ties, Wood Cross (See Poles, Ties, Posts, etc.)
- Tongue Switches
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- Tool Steel
Bethlehem Steel Co.
Carnegie Steel Co.
- Tools, Track & Miscellaneous
American Steel & Wire Co.
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Hubbard & Co.
Railway Trackwork Co.
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- Towers and Transmission Structures
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- Track Expansion Joints
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St. Louis Car Co.
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- Ohio Brass Co.
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General Electric Co.
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Ohio Brass Co.
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Our advertisement in the issue of August 7 showed how
HASKELITE and PLYMETL

are being used in modern cars.
Another ad will appear next week.

HASKELITE MANUFACTURING CORPORATION
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PEREY TURNSTILES
or **PASSIMETERS**

Use them in your Prepayment Areas and
Street Cars

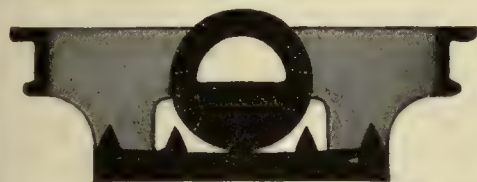
Perey Manufacturing Co., Inc.
101 Park Avenue, New York City



Car Heating and Ventilation

are two of the winter problems that you must
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to take care of both, with one equipment.
Now is the time to get your cars ready for
next winter. Write for details.

The Peter Smith Heater Company
6209 Hamilton Ave., Detroit, Mich.



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BEARINGS

A. STUCKI CO.
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For Cars and Buses

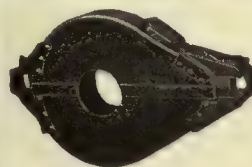
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1800 Lehigh Ave., Philadelphia, Pa.

THE BEST TRUSS PLANK ELECTRIC HEATER EVER PRODUCED



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478E

GOLD CAR HEATING & LIGHTING CO., BROOKLYN, N. Y.



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One-Piece Gear Cases

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Best for Service—Durability and
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682

RAILWAY UTILITY COMPANY

CAR COMFORT WITH **HEATERS**
UTILITY **REGULATORS**
VENTILATORS

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Eliminate rail joints
by

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METAL & THERMIT CORPORATION
120 Broadway, New York City, N. Y.

The Most Successful Men in the Electric Railway

Industry read the

ELECTRIC RAILWAY JOURNAL

Every Week

H B LIFE GUARDS

PROVIDENCE FENDERS

Manufactured by

CONSOLIDATED CAR FENDER CO., PROVIDENCE, R. I.

General Sales Agents

WENDELL & MacDUFFIE CO., 110 E. 42nd St., N. Y. C.

Your Name

in this space in all issues where larger
display space is not used backs up your
advertising campaign and keeps your
name in the alphabetical index.

SEVEN WORKS
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Ramapo Ajax Corporation



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FOR PASSING SIDINGS
TEE RAIL SPECIAL WORK
MANGANESE CONSTRUCTION
SALES OFFICES AT ALL WORKS
Main Office, HILLBURN, N. Y.



From 13 to 65 Per Cent

Report of A. E. R. A. Committee on Essential Features of Modern Cars reveals remarkable returns on modern light-weight car investments

Apparently many electric railways have already recognized the fact that their equipment has passed that point after which it is really profitable to purchase new cars. An investment which will net such a substantial return, 13 to 65 per cent, as shown by the figures included in the Report of the A. E. R. A. Committee on Essential Features of

Modern Cars can hardly be overlooked.

With such convincing proof available and with such convenient financial arrangements at their disposal, electric railways are quickly taking advantage of the economical operation and increased revenue producing facilities obtained with light-weight modern cars.

Light-weight cars, built by Brill, modernly designed and equipped, are proving profitable investments to many electric railways.

BRILL THE J. G. BRILL COMPANY BRILL
PHILADELPHIA, PA.
 AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MAN'G CO.
 ST. LOUIS, MO. CLEVELAND, OHIO. SPRINGFIELD, MASS.

Bus facts from Philadelphia

No. 1

"The best evidence of our faith in the gas-electric bus is that we ordered 202 buses in January, 1925, and in January, this year, we found it advisable to place an additional order for 160 more of the same type."

No. 2

"The maximum mileage we have accumulated on any one vehicle (gas-electric) is 47,351 miles. This bus has been pulled-in twice, once for a broken starter and again for a burnt-out ignition coil."

No. 3

"Our average schedule speed, being the result of dividing the miles operated by the actual running time between terminals, is 12.02 miles per hour. In this calculation the interurban buses have been eliminated."

"... a factor which affects speed to the extent of 10 per cent affects costs to the extent of about $1\frac{1}{2}\%$ for wages alone, and furthermore affects the fixed charges in the same ratio because as speed increases it is possible to give the same service with less equipment."

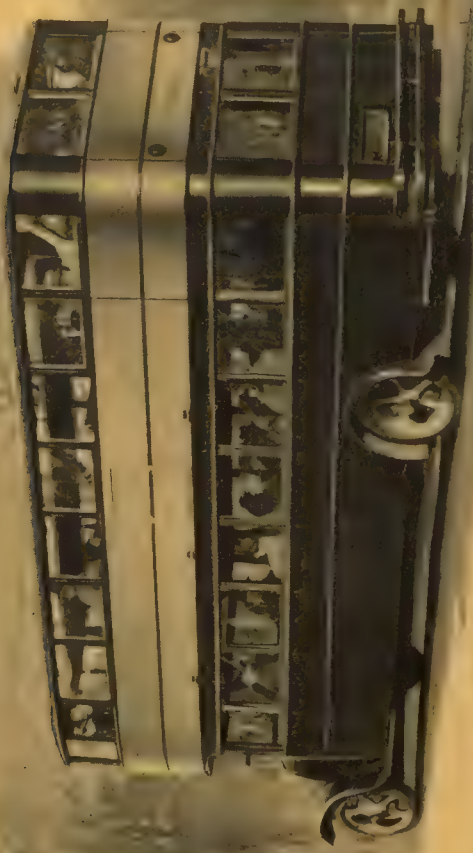
No. 4

"We find the mechanical-drive buses are averaging during a month about 24 miles per quart of oil, while our gas-electric buses show an average of about 38 miles."

From a paper by R. H. Horton, President, Philadelphia Rural Transit Company. His comments were based on 8 months operation of gas-electrics.



Like other new General Electric products, gas-electric bus equipment was put on the market only after extensive engineering and practical tests had demonstrated the soundness of the principle and certainty of its success. G.E. engineers have since gained added experience with equipments in service of varied character. Learn from them the importance of having electric drive.



Nothing compares with the Gas-Electric

That the Gas-Electric bus has advantages, both from operating and maintenance standpoints, has been verified on every property where electric drive has been introduced.

Think of operation so quiet that residents who had complained of the noise of buses climbing a near-by hill in second gear registered no objections after motor-driven gas-electric buses were placed in service.

The driver, having no clutch to operate and no gears to shift, can keep his eyes on the road and the traffic, regulating his speed entirely by pressing the accelerator. This fact has a bearing on the two most costly phases of operation wages per bus-mile and accidents.

Gas-electric bus operators are only beginning to realize the possibilities offered by this type of equipment for accurate testing with electrical instruments to determine definitely the results of overhauling the engine. Electrical measurements also furnish a means of knowing whenever any bus is not operating at maximum efficiency, whether the trouble be in the engine, the motive power, or with the driver.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

SALES OFFICES IN PRINCIPAL CITIES

ELECTRIC RAILWAY JOURNAL

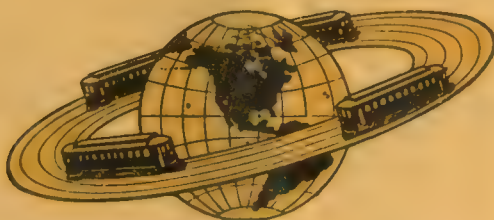
Collier Service

Collier Service is built upon a foundation of wide and successful experience over a period of years. It has grown to be a national organization of experts exceptionally well trained to create and maintain car advertising space values.



Barron G. Collier Inc.

Candler Bldg., New York



- COILS -



Here is a Coil that is improperly impregnated. The gum penetrated only to the first few turns. Only the bare cotton insulation protects the main conductors. It has none of the dielectric, moisture, and heat-resisting qualities of a properly impregnated coil. Improper impregnation is a frequent cause of coil failure.



Here is a Coil impregnated by Westinghouse. It was taken from stock at random and cut. Note that the gum has penetrated every turn; that it has been forced into all of the insulation and filled all the air space between conductors. The entire coil is a solid mass, resistant to moisture. It has high dielectric strength. Because of its mass unity, it can better dissipate heat. It can better withstand the vibration and pounding incident to severe operating conditions.



And these are some of the precautions Westinghouse takes to assure a uniform quality of coils. Skilled men work under the supervision of capable engineers. Specially designed machinery provides constant heat and air pressure control. Tests are made of the gum to insure correct composition. Full time and pressure requirements are met; there is never any stinting or lowering of Westinghouse standards. Test coils are run regularly. If the test coil is not thoroughly impregnated, all apparatus in the run is treated again.

These precautions cost money. But they assure Westinghouse customers of dependable renewal parts. They save more than their additional cost in longer, more satisfactory service.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries



Westinghouse

X88817

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No. 8

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"Rut Insurance"

EVERY week in ELECTRIC RAILWAY JOURNAL there is a special department under the heading of "Maintenance Notes" containing suggestions primarily for the men in charge of that class of work. Once each month the entire issue is devoted to maintenance subjects.

Articles of this kind are intensely practical in their nature. They are intended to keep maintenance executives in touch with methods, practices and devices that have been found helpful on other railway properties.

Articles on maintenance practices are sought and encouraged by the JOURNAL. A minimum of \$5 is paid for short items suitable for publication. Longer maintenance contributions receive compensation at special space rates.

It is an unwise executive indeed who does not encourage suggestions for improved methods from the men in the ranks of his own organization. But it is obviously an even greater oversight to disregard the methods and appliances on which some other shop has done all the development and experimental work. To the maintenance man, participation in such an exchange of workable ideas and careful study of the methods devised on other properties constitute the best forms of insurance against getting in a rut.

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SAVING THE RAIL SAVES THE RAILWAY

Quiet track gives low maintenance cost

Mr. H. E. Bean, Engineer Way and Structures, New York State Railways, expounds our text better than we can. Excerpts:—

“Complaints of noise emanating from street cars show that guests in hotels, worshippers in churches and people congregated for other purposes demanding quiet are the ones likely to be affected. Unusual noise in any location will immediately bring inquiries and protests from local residents.

* * *

A comparatively small amount added to maintenance allotments will eliminate a large proportion of the most disagreeable noises if properly expended.

Noises emanating from track conditions may be divided into the two general classes of (1) noises resulting from the degree of maintenance and (2) noises due to the type of track and pavement construction.

The first is of major interest at this time because it is the cause of the greater portion of noisy operation and also the easier and more economical point of attack.

Low track joints or cupped rails should be repaired for economical reasons alone. Blows resulting from these causes are destructive in the extreme and will soon necessitate a much larger expense for repairs.

Corrugation develops very rapidly after the initial waves are formed. When allowed to become aggravated it is destructive of track foundation, pavement and rolling stock.

It seems obvious that the reduction of noise will be accomplished by expenditures which are bound to show good returns through lessened costs by making timely repairs. Unnecessary noise and destruction are synonymous for track structures, lessen one and the reduction of the other follows.

Manufacturers have developed welding and grinding outfits, quick-setting cements, speltering outfits, air tools and many other devices which make for speed and economy in repairing defects at a minimum cost.

To summarize, the accomplishments of reduced noise from track conditions might be stated as follows:

1. Ultimate lessened expense due to less destructive blows affecting both track and rolling stock.
2. Better relations with public living adjacent to lines or coming in contact with avoidable noises in home, business, entertainment or church.
3. More desirable service to patrons, providing not only a more quiet but also a smoother and more attractive ride.

Here is equipment for silencing noisy track.

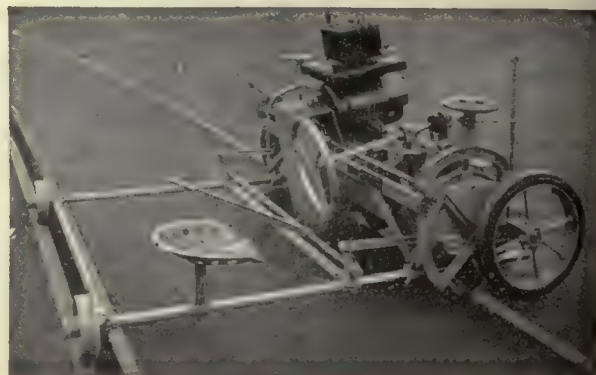
*Quotations?
Bulletins?*

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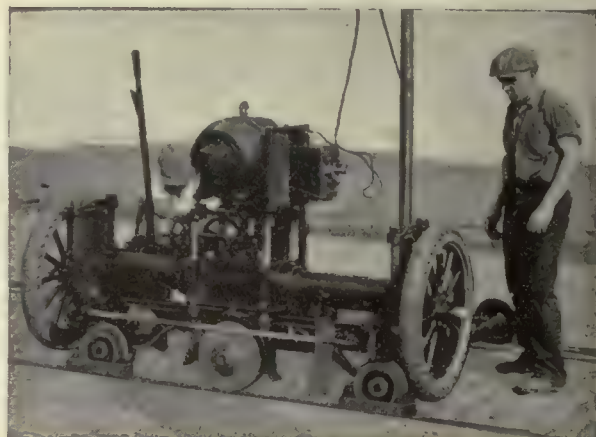
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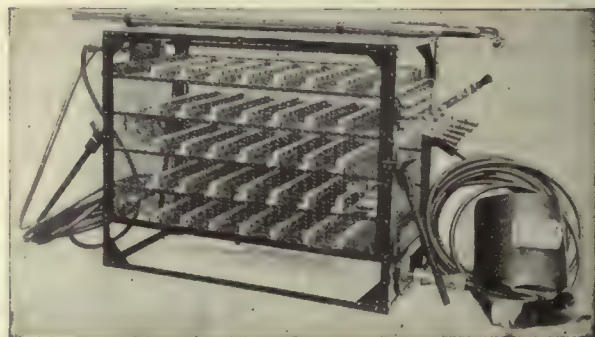
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“Imperial” Track Grinder



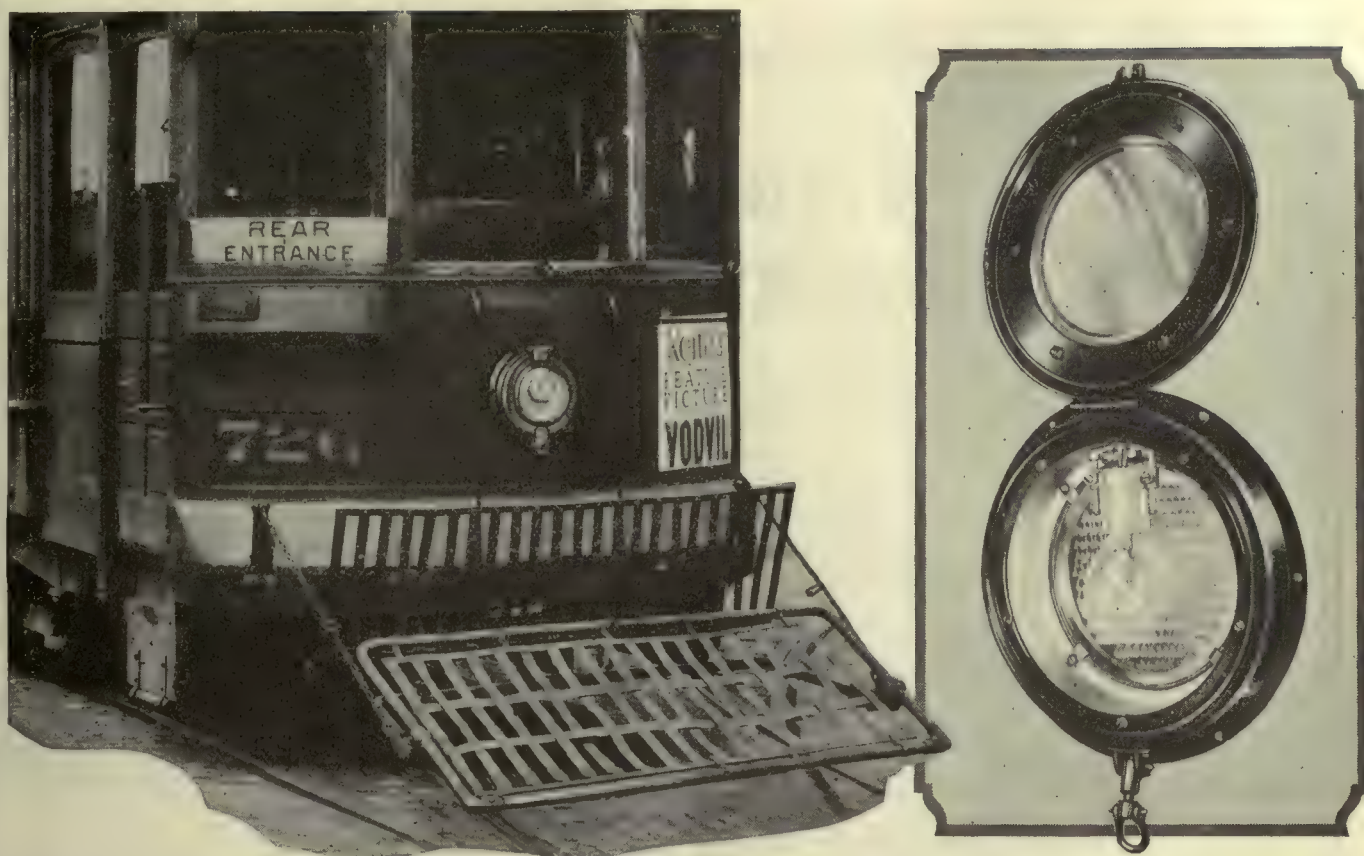
Reciprocating Track Grinder



“Ajax” Electric Arc Welder

1269

SAVING THE RAIL SAVES THE RAILWAY



The ZP Special — A New O-B Headlight for City Cars



Designed for flush-type mounting with minimum projection both inside and outside of dash.

LOW first cost and practically no maintenance over a long period of years, are the outstanding advantages of the new ZP Special Headlight for city service.

Provided with a prismatic reflector that spreads the beam in the horizontal plane only, the ZP Special gives a diffused light that illuminates both sides of the track. In addition it gives ample pick-up distance due to its higher beam candle power. Any type of lamp from 23 to 94-watt may be used—a convenience when concentrated filament lamps are not available.

The casing is of exceptionally heavy Armco Iron, offering maximum resistance to weather. It is made thoroughly dust-proof. Its flush type mounting, a design that conforms to the curvature of the dash, and its theft-proof lock (optional) are other desirable features.

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On this basis Davis "One-Wear" Steel Wheels are the most economical. They avoid the expense of contour conditioning.

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4 miles with Twin Ties on the P. R. T.

One of the 30 odd installations of Twin Ties now in progress, or scheduled for the present season, illustrated above, is in Philadelphia.

Several separate jobs using either Standard Twin Ties laid on a renewable base, or Renewal Ties being used to build new track over old

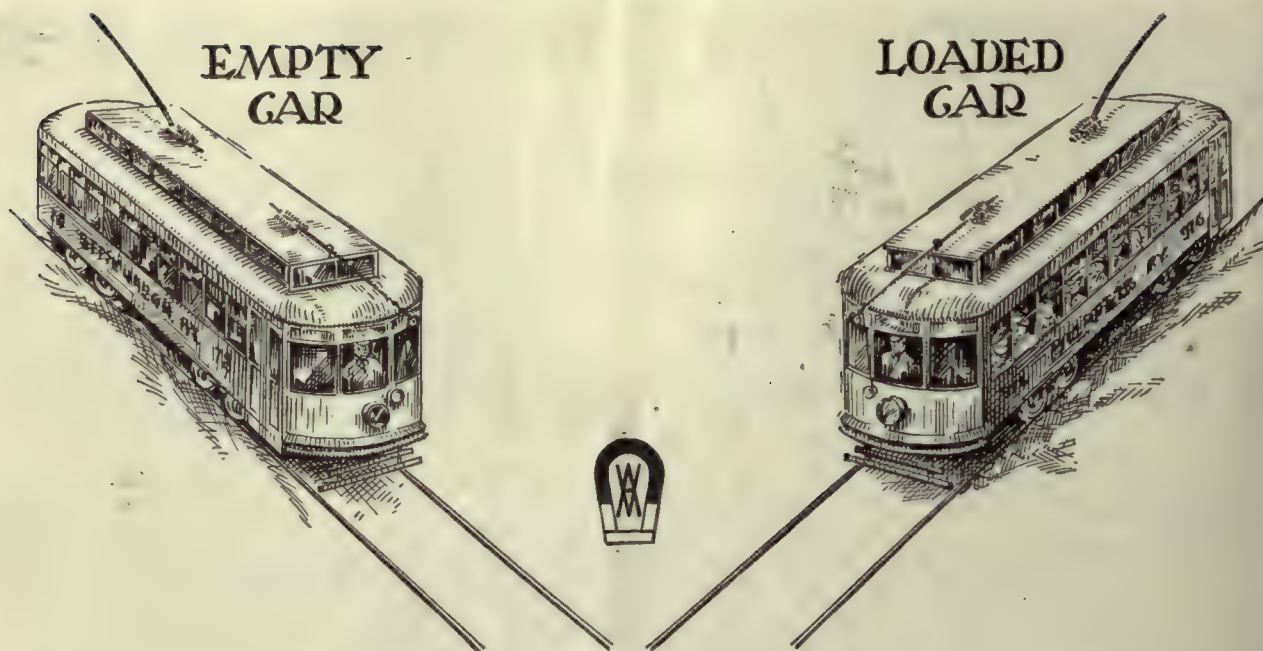
concrete base, are now in progress there.

We have prepared a folder describing all details of this work, part of which was done under traffic with quick-setting concrete, which we will be glad to send all interested railway men.

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track Permanent Foundation



Stabilized Stopability—

—throughout the entire range of car loading means—

—safe and swift car movement, through congested districts;

—ability to hold traffic position with other moving vehicles, inasmuch as peak speed can be held longer between stops;

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—seconds saved, that may collectively be counted as dollars;

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Many traction companies, recognizing the auspicious part Westinghouse Variable Load Brakes can play in effecting these far-reaching advantages, are specifying this new type equipment for their modern light weight cars.

Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office. Ask for Descriptive Catalogue T-2045.

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General Office and Works: Wilmerding, Pa.

WESTINGHOUSE TRACTION BRAKES

ESSCO BULLETIN

Devote this week
to improving —

Maintenance!

Keep these always
in mind -----

Safety
Publicity
Illumination
Convenience
Maintenance
!

TO KEEP cars out on the road earning revenue requires a repair shop that must be right up-to-the-minute in every respect.

Designed and built for car-shop use, Keystone Shop Equipment provides the basis for a thoroughly modern and efficient repair shop.

Select the items needed from the list shown below.
Complete particulars sent on request.

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KEYSTONE SHOP EQUIPMENT

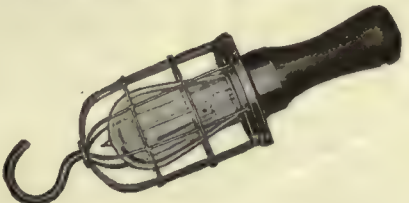
Partial list of shop specialties



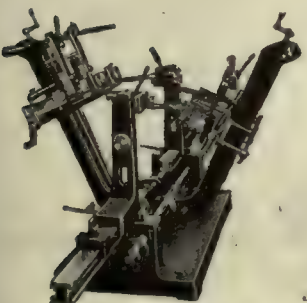
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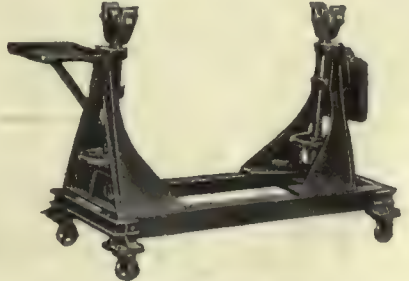
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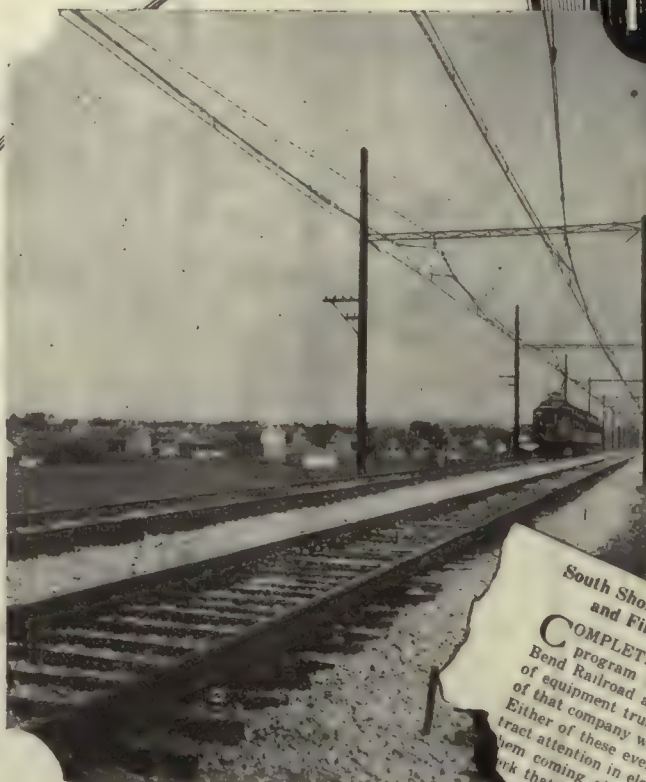


Peerless Pit Jack



Type A Armature Stand

The "South Shore Line" comes into its own!



Reprinted from an editorial notice in Electric Railway Journal.

South Shore Road Rehabilitation and Financing Attract Attention

COMPLETION of the first unit in the rehabilitation program of the Chicago, South Shore & South Bend Railroad and of the public offering of \$1,060,000 of equipment trust certificates secured by rolling stock of that company were announced almost simultaneously. Either of these events would have been sufficient to attract attention in electric railway circles, but the two of them coming almost together certainly emphasize the work that has been done on the road and testify to the confidence by the bankers of the road and testify to the strong position of the company.

With Phono-Electric an exclusive trolley wire specification

No more decisive answer to the question "are the electric railways losing ground" could be made than by pointing to Chicago's "South Shore Line."

Here for the past year under the leadership of Samuel Insull and his associates, the avowed intention has been to make this line a model of all that is best in modern electric railway practice.

It is particularly interesting to note that Phono-Electric is being used exclusively in the new overhead work—some 77 miles having been ordered to date.

Trains will be run at high speed on short headway. Most of the overhead is exposed to the full force of the elements. Differences between winter and summer temperatures

"Bridgeport"
TRADE MARK
Phono-Electric

(and often between day and night temperatures) are extreme.

Yet standards of service were never set higher.

No chances were taken. Phono was chosen because high tensile strength and resistance both to mechanical and temperature fatigue make it a boon to the high-speed, short-headway road. Service records on many other properties where Phono has made remarkable showings, proved its "true to form" behavior under widely different conditions.

We're certainly proud to print this good testimonial to Phono and the "South Shore Line."

The Bulletin of Phono Facts is yours on request!



Bridgeport
Brass Company
BRIDGEPORT - CONNECTICUT

A city example

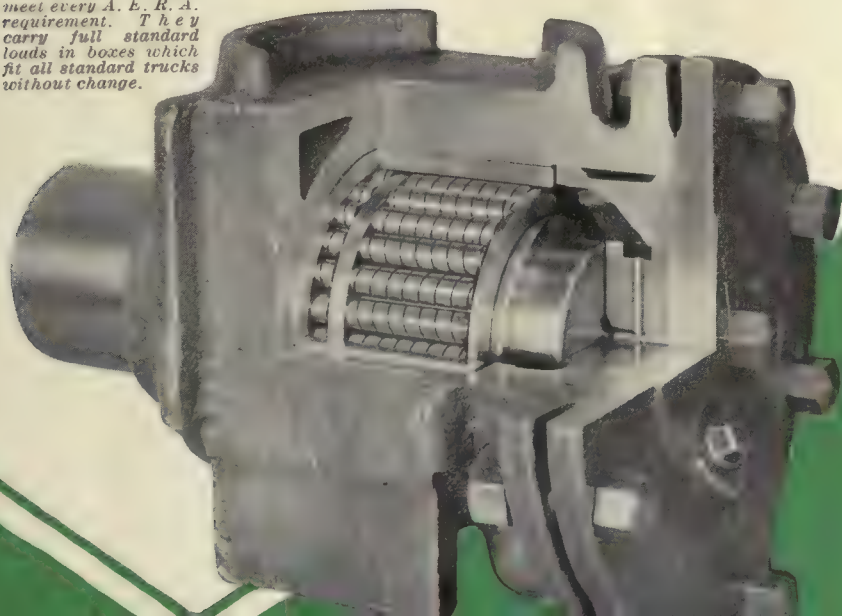


**Oil City car
achieves record
on roller bearings**

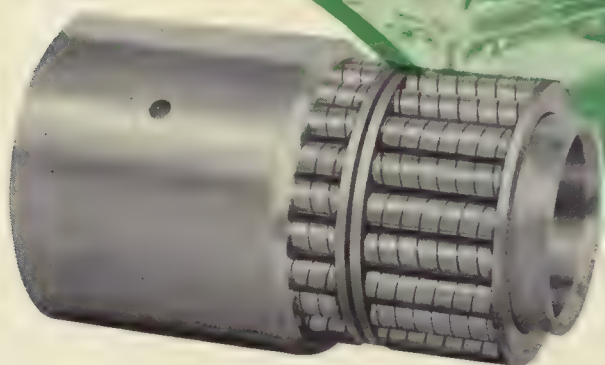
Four-wheel one-man car giving satisfactory service since July, 1924. Has made an enviable record for power saving and low upkeep expense. This Hyatt-equipped car is running in Oil City, Pennsylvania.

Proved- by more than
a million and a quarter car miles

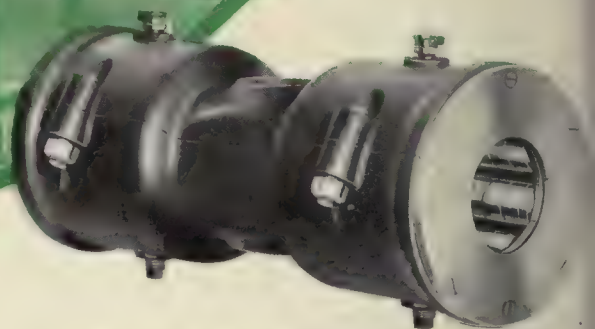
*Hyatt Roller Bearings
meet every A. S. B. M.
requirement. They
carry full standard
loads in boxes which
fit all standard trucks
without change.*



HYATT
QUIET ROLLER BEARINGS



*Hyatt Roller Bearing as used
in railway journal boxes.*



*The new narrow center Hyatt
Line Shaft Roller Bearing.*

A long-established factor in the Nation's industrial machinery

For more than thirty years, Hyatt Roller Bearings have been applied in constantly increasing numbers to line shafting and machines of every kind.

This long record of dependable per-

formance in industrial equipment and the million and more miles of satisfactory service they have given in railway applications is due to Hyatt design and Hyatt construction. They are long lived bearings.

HYATT ROLLER BEARING CO., NEWARK, N. J.
(Division of General Motors Corporation)

SNOW!



*it's sure
to come*

Get ready now—check up on
your snow-fighting equipment
for the coming winter

McGuire-Cummings Single and Double
Truck Snow Sweepers and Plows are
“Standard Equipment” on practically
every Electric Street Railway Line in the
United States and Canada that has snow
to contend with.

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Successors to McGuire Cummings Mfg. Co.

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Light Weight City and Interurban Cars

Single and Double Truck Snow Sweepers and Plows



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Shown above is Type 15A, designed to meet this condition in electric railway operation. Type 15 is designed on the same lines for de luxe buses. They may be upholstered in leather, plush, or other fabrics as desired. Both types built to give extreme comfort in remarkably small space.

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End the
radio interference
complaints /

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*improves public
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several ways*

One of our customers told us

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Remember that a defective bond causes almost continuous arcing which in turn sets up disturbances that affect radio reception in every nearby home.

Smoother riding, noise reduction, less paving disturbance and the elimination of radio interference, are four essential benefits to public relations which are easily and economically attained by Thermit welding—i.e. joining instead of jointing the rails.



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120 BROADWAY, NEW YORK, N.Y.

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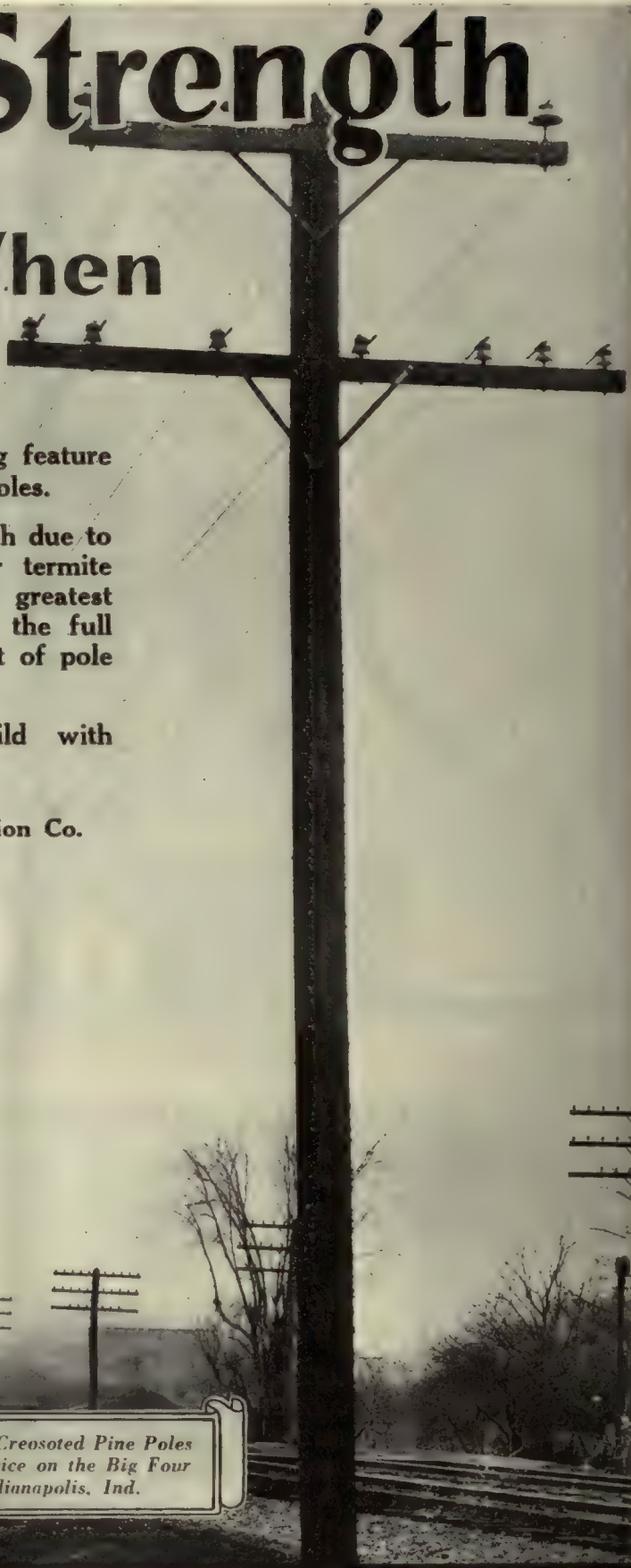
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Lasting Strength

Counts Big When Storms Rage

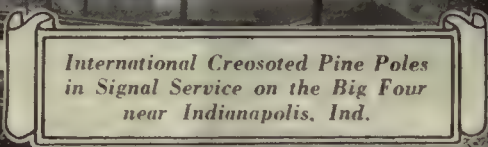


LASTING strength is the outstanding feature of *International Creosoted Pine Poles*.

There is no gradual decrease in strength due to decay or weakening due to birds or termite attacks. When storms rage and the greatest strains come, they are conquered by the full strength of Yellow Pine—the strongest of pole woods.

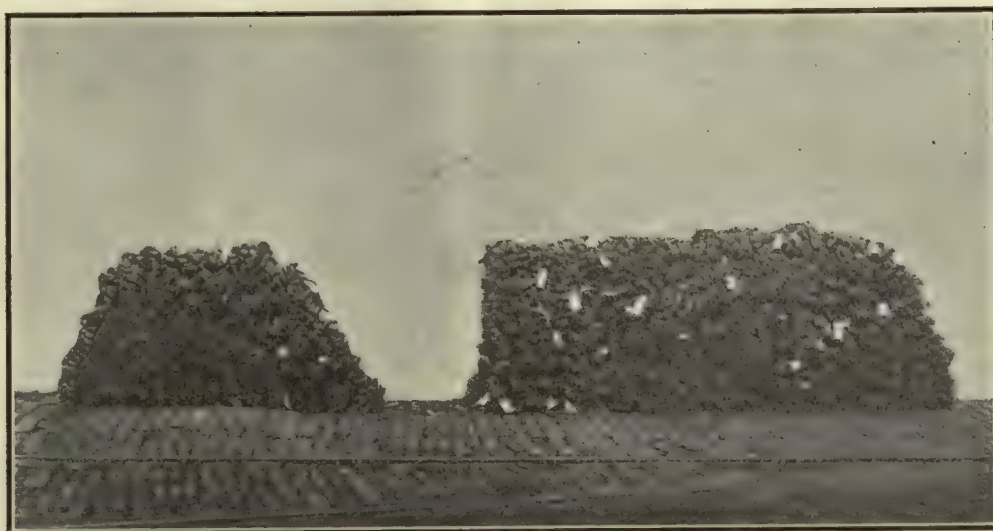
When you build your line — build with *International Creosoted Pine*.

International Creosoting & Construction Co.
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*International Creosoted Pine Poles
in Signal Service on the Big Four
near Indianapolis, Ind.*

International Pressure Creosoted Yellow Pine Poles



Do You Buy Brake Shoes On Price Or Ultimate Cost?

THIS photograph shows two piles of worn out Brake Shoes. The smaller pile did the same amount of work in the same service as the larger pile. The small one contains the American Brake Shoes and the large pile the ordinary Cast Iron Shoes required for the same work. The American Brake Shoes were 27% higher in price but their use resulted in a net saving of 31.8%. The American Brake Shoes, in other words, lasted so much longer and did so much more work that they not only wiped out the difference in price but saved the user almost one-third of his total brake shoe expense.

"Best by Test"

**THE AMERICAN BRAKE SHOE
AND FOUNDRY COMPANY**

30 CHURCH ST., NEW YORK
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The illustration above shows the Cambria Wheel Plant of Bethlehem Steel Company at Johnstown, Pa. Cambria forged axles are also made at Johnstown.

Cambria

rolled steel wheels for
Electric Railway Service
insure maximum mileage
and safety

Other Bethlehem Equipment for Electric Railways:

Axles
Bolts
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FIFTEEN new
double-truck,
double-end safety
cars of the Virginia
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are equipped with
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Rolled Steel Wheels.



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more feeder copper

?
or
!



G-E Automatic Sectionalizing Switches

Dozens of electric railways have taken advantage of this economic alternative; others have it included in their plans for improved distribution.

G-E Automatic Sectionalizing Switches tie feeder sections together, to equalize voltage conditions and obtain for the entire system the maximum usefulness of the total feeder-copper capacity.

At the same time they act as automatic breakers to cut out any section where there is a "short" or dangerous overload, then automatically close to re-establish connection between the sections when normal conditions are restored.



General Electric representatives will gladly investigate your conditions to determine if Automatic Sectionalizing Switches can be applied to advantage.



For

Modern Equipment Standards

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, August 21, 1926

Number 8

Deformation of Bearings Causes Trouble

WEAR on the sides and tops of journal bearings and on pedestal jaws and wedges permits the bearings to twist from their normal position. Light construction allows deformation under load and results in a non-uniform bearing surface. Loosely fitting covers for journal boxes permit water, snow and dirt to enter and the oil to leak out. These are some of the troubles that the German State Railways have attempted to overcome, as described in an article by Erich Schulze in this issue.

Probably the most interesting conclusion shown by the extensive investigations is the extreme variation in pressure on the bearing surfaces. It was found that the maximum pressure of the ordinary journal bearing was not at its center but at the two ends and that instead of coming directly on top of the axle that the line of greatest pressure was displaced about 5 deg. against the direction of rotation. When bearings run hot the heating was found to begin at the ends. Evidently a construction that will provide uniform pressure throughout the length of the bearing will decrease troubles from hot bearings.

The author states that investigation is being made toward producing a metal for bearings that will provide some lubrication even when hot. Tests with the new design show that the bearings will operate for a limited time even though lubrication is stopped. That is a material improvement over types of journal bearings now in use.

The Hand of the Blacksmith Seldom Produces a Work of Beauty

MANY shop-made devices and home-made improvements to electric cars and shop equipment are described in the issues of *ELECTRIC RAILWAY JOURNAL*. As a rule these are very ingenious and frequently they produce substantial savings in both time and labor. Few of them, however, have the finished and attractive appearance of a factory-made product. The advantage which results to the railway from the use of such devices is almost entirely utilitarian. Care should be used particularly not to apply these to some of the modern cars in such a manner as to detract from their appearance.

Everyone is talking about "de luxe" cars as a factor toward producing better public relations and increased patronage. If the modern car is to perform effectively in a competitive field it must wear good clothes without obvious patches. If there must be rough parts they should be covered or blended into the whole so that they do not appear patchy.

Of course on cars of older design, such shop-made equipment is less out of place because such cars were more a blacksmith job. But rough, exposed parts have no place on modern cars. While they may serve their purpose mechanically, they detract from the effect of the complete ensemble.

To obtain the proper balance between utility and beauty is only one of the problems of the equipment man. It is an important feature of ride selling. The vehicles used must perform in every sense of the word and a definite part of the performance is appearance.

Standardization May Be Carried Too Far

STANDARDIZATION is the order of the day. That it has resulted in enormous savings in industry no one can deny. It has reduced duplication and has paved the way for simplification of manufacturing processes, of sales methods and of storeroom practices. There is still a great field for further development of standards and reduction of waste, particularly in the electric railway field.

Like all good things standardization has its limitations. Adoption of a single standard for a property may lead to excessive costs, with continuing fixed charges that cannot be justified economically. An instance of this sort is in track construction. One large property, for instance, adopted a standard track design and has since used it for all new work and reconstruction. The design is excellent, and is suitable for the operation of the heaviest cars used on the system and the most frequent headways.

But there are suburban sections in and about this city where cars of a lighter type are used and where the headways are much less frequent than in the central business district. A much lighter track would be ample and it will be many years before the growth of the community would render it inadequate. Yet in order to maintain the standard, track suitable for the heaviest city traffic is laid.

Whether it is essential to carry a standard to this extreme is debatable. Of all parts of a railway, the track is one of the most permanent, and is disturbed the least after it is once installed. Unless the saving due to standardized design and construction methods is such as to bring the cost down to that of a lighter track, there is considerable justification in the adoption of at least two types—one for heavy traffic on congested thoroughfares, and the other for lighter suburban service.

The subject is of sufficient importance to make it well worth consideration. In the final analysis it is a problem in economics, and a definite solution can only be arrived at for each specific case. But a general treat-

ment can be made that permits of ready adaptation. Such a treatment would be a valuable addition to electric railway knowledge.

Underwriter's Label on a Completed Car an Asset

IT IS now possible to obtain an underwriters' label for a complete car. James S. Mahan, president of the Western Section, International Association of Electrical Inspectors, in a talk before the equipment men at Chattanooga spoke of the value of such a label to railway companies.

In discussion, it was brought out that the saving of insurance premiums per car would be from \$7.50 to as high as \$20 a year, depending on the conditions on the property. At least the saving is more than the initial cost of inspection and label, which is \$5 per car. It would be difficult to find a better investment for \$5 than this service will bring.

At least one car builder has said that the cost of car construction need not be any higher to comply with the Underwriters' standards than for any other good construction. It does mean, however, that the customer specifying materials must not insist on non-approved materials.

There was a time when the restrictions of the underwriters required certain types of construction that did not meet what many master mechanics believed to be good practice. Metal conduit was not entirely satisfactory. Condensation of moisture proved a nuisance. With the manufacture of new materials the underwriters have broadened their requirements to include flexible wire covering.

It is now quite possible to specify that the entire car shall be so constructed and equipped that it will pass the underwriters' inspection and still include the equipment and construction preferred by the customer with but very few exceptions. To gain the advantage of this approval it must be specified in advance.

New Truck for Electric Cars Offers Many Interesting Possibilities

CARS bought by electric railways during recent years have been largely of the double-truck type. The reasons for this lie in the demand for a larger car body than can be installed satisfactorily on the usual type of single-truck and to the easier riding qualities of double-truck cars. As far as the loads carried by electric cars are concerned, there is no reason why a car should have more than four wheels.

Tracks in city streets necessarily have many short radius curves, which limit the length of wheelbase that can be used under single-truck cars of the usual type. The length of the car body that can overhang the truck is another limitation that must be considered or the side sway and teetering action will be excessive.

An interesting development in car construction is the attempt made in Switzerland to provide a long wheelbase truck for electric cars and still retain the advantage of light weight which goes with a car having a four-wheeled truck. The construction is described elsewhere in this issue. In addition to providing a long wheelbase the experimental truck does not use the axle-hung suspension for the driving motors, but mounts them on a small four-wheeled truck located between the two driving axles. The motors are thus spring sup-

ported and their weight does not come as a dead load on the axles.

By use of a cardan drive through bevel and spur gearing from the motors to the axles several important results are accomplished. The gearing is inclosed in an oil-tight casing so splash lubrication can be used and there is no danger of dirt or dust getting in. Gears are located equidistant from the center line between the wheels, preventing any tendency for the axle to be forced out of alignment and reducing the wear of bearings and gearing. The axle for a pair of wheels is cut in two, each half being fitted with a spur gear, which in turn is driven from a jackshaft and bevel gearing. This allows each driving wheel of the corresponding axle to displace itself with regard to the other wheel and makes it easy to negotiate sharp curves. The tendency for one wheel of a pair to slip is also done away with so there should be less wear on rails and wheels. By using a gear ratio between motors and driving wheels about twice as high as with ordinary axle-hung motors smaller and lighter motors can be used.

The new truck construction has a flexibility that will appeal to the mechanical men of electric railways and presents many ideas in design that may suggest ways to improve on present trucks.

Revival of Hudson River as Traffic Artery Suggested

RIVER transportation, fed by crosstown buses, is suggested to the New York Transit Commission to relieve congestion in New York City as a result of a survey made for the commission during the recent strike of subway motormen on the Interborough Rapid Transit Company. The plan advanced contemplates the use of high powered boats to transport persons up and down the North River with bus lines feeding the boats at such points as 125th Street, 96th Street, 42nd Street and Rector Street, with a possible stop at or near 14th Street.

With the coming of the bridges over the East River and the tunnels under both the East River and the Hudson River, many of the ferries fell into disuse. However, the only means of communication with Staten Island is by ferry from New York, Brooklyn and New Jersey and a goodly business by ferry is still done on both the East and the Hudson Rivers by high-speed boats operated at frequent intervals. The suggestion now made, however, contemplates longitudinal traffic on the river from uptown New York to midtown and downtown New York. The likelihood of fogs and of floating ice in the winter are, of course, hazards, but they operate against the present ferries. Greater obstacles appear to be that the river is congested with craft at present and that the proper berthing accommodations might be difficult to secure.

Although the scheme might seem to be a throwback, it has several novel features. Paris presents an instance somewhat akin to the one the author of the present plan apparently has in mind. There, under the Department of the Seine, 130 surface car routes, 53 motor bus routes, 4 railroads operated over private rights-of-way and a steamboat line are all tied in together. On the Seine, in recent years, 40 boats, each of a capacity of 400 persons, were being run as part of the system in which all water and surface transportation facilities are a unit. It is not planned to extend the

river transportation, and reports state that when the present boats wear out they will not be renewed. Furthermore, they have been laid up for some four months the last few winters. This would indicate that in Paris the plan has not been entirely successful under modern conditions.

No matter what the obstacles may appear to be to the suggestion just made in New York, the problem of transporting the millions of the metropolis is too grave and the reputation of the author of the plan as an engineer is too good airily to dismiss the recommendation as impracticable or beyond the realm of realization.

Maintenance Men Have a Part in Creating a Friendly Public

GOOD maintenance as a valuable asset in the establishment of friendly public relations was the essence of E. D. Reed's talk before the Southern Properties' maintenance men at their recent Chattanooga meeting. Good maintenance, of course, helps to make service reliable—and this is essential. But clean cars and the quick repair of little things is what counts in gaining direct public approval. On many small lines, requiring only two, three or four cars, a loose window, a torn seat or broken hardware soon becomes noticeable. It becomes a distinguishing mark for that car. In the end, the part may be repaired or replaced, but delay creates a bad impression in the minds of many people.

If, on the other hand, repairs are made promptly, an eyesore is removed. This requires careful inspection and quick repairs. The result is not only better service but a better public impression. Public relations is a real, though intangible thing to which live maintenance men are giving attention. The operations of all departments affect directly or indirectly a company's relations with its public. But those charged with maintenance responsibility play a leading part in this work. Good housekeeping attracts riders. "A stitch in time" is an important rule of the good housekeeper.

Public Is Getting One-Sided View in I.C.C. Inquiry

FAULT is found with the steam railroads because the only side that the public is hearing in the I.C.C. inquiry into the bus and freight business is the bus and truck side. The *Railway Age* says that the industry it represents has responded nobly in answering the questionnaire and that this is perhaps the best possible witness, but it laments that so far as the picture is concerned that is being presented to the public at the hearings the questionnaire is silent. This criticism also holds true of the electric railways. They are understood to have replied liberally to the questionnaire, but despite persistent urging the hearings so far held, except the one at Chicago, give the idea that they, too, are largely content with the silent presentation of their case.

Of course it is imperative to convince the commission that the situation as it exists contains elements that the railroads feel should be corrected, but it is highly desirable for the railroads so to present their case that the public may know the full legitimacy of such suggestions as they offer. Electric railway men have attended the

hearings, but except at Chicago they have been inarticulate. On the other hand, the public presentation of the side of the motor carriers goes on in a stream almost endless. It is not that the motor carriers are better fortified with facts than are the steam railroads and the electric railways, but that by the very nature of the business in which they are engaged the motor interests are able to judge better the value of their material in helping to create favorable public opinion through the newspapers and in sustaining such opinion once it has been created. They are shouting their case from the house tops. This may be a method in a proceeding of this kind not regarded by those in steam and electric railway work as consonant with their ideas of the dignity of the proceeding, but the railroads and the electric railways may well sacrifice some of their dignity in order to use as effectively as the motor interests are doing the opportunities offered to present their case to the public.

Philadelphia Gets After Bus Parked in Public Streets

LEXICOGRAPHERS may quarrel over the derivation of the word bus-caneers, invented recently in Philadelphia, but the menace intended to be described by the appellation certainly is a serious one. Bus-caneer is said to have had its inception in the realization on the part of its originator of the likeness of the bus operator who hogs the street to the old-time buccaneer. Be that as it may, Philadelphia is up in arms against the buses engaged in sight seeing and in touring service that make a parking place of the public streets, and it has ruled against them to the extent that not more than one such vehicle shall be parked on either side of the street in any one block for loading at one time.

As many as eleven buses are said to have used one block at one time in Philadelphia. The idea of the police was that this was nine too many. And public sentiment appears to agree with that decision. Streets so cluttered up became almost impassable for other vehicles, and this is what happened in Philadelphia. So far the disposition of the owners of the vehicles affected has been to comply with the regulatory measure put into effect by the police, but it appears that the Department of Public Safety, as the police of Philadelphia are known, is prepared to make good its threat to compel the operators to observe a degree of order that shall take into account the rights of other users of the streets. In this connection it is interesting to note that Atlantic City, into which buses pour every day in an almost endless stream, has taken similar action.

In the past there have been a few sporadic efforts of this kind at regulation, but none that had behind it the apparent determination of the public officials shown in these instances. A nuisance may be merely a nuisance by inference. On the other hand, a nuisance may grow out of a practice which in its singleness has no earmarks that stamp it as beyond the realm of the reasonable, but becomes objectionable by mere numbers or by the repetitive process. This is what has happened in the case of the bus that parks in the public streets. It has become a nuisance and menace by its numbers. So again it may be said that the word bus-caneer may not have its roots well grounded in good usage, but in the sense that the term is being used in Philadelphia it does personify a pest.



In the Foreground the Paving Base of Concrete Has Been Poured. Ahead of This Work Is the Twin Steel Tie Construction Thoroughly Tamped with a Dry Mix of Lumnite Cement and Traprock screenings

Modern Methods Used in Reconstructing Track Under Traffic

The Philadelphia Rapid Transit Company Recently Completed Three Blocks of Track Reconstruction Under Heavy Traffic Conditions, and with Vehicles Using One Side of Narrow Street—International Steel Twin Ties Supporting 7¼-In. Girder Tee Rail, Thermit Welded Joints, and Lumnite Cement All Helped in This Rapid Work

BY USING the old track substructure with twin steel ties supporting a 7¼-in. girder tee rail, the Philadelphia Rapid Transit Company was able to reconstruct three blocks of track on Eleventh Street, immediately north of Market, without interrupting traffic for longer than one period of from 30 to 50 minutes in each block. The street is very narrow, being used for one-way traffic only, with a single track in the center, and is normally greatly congested with vehicular movements, of which about half are of commercial vehicles. The city, desiring to keep the street open, had insisted before the work began that the roadway on the west side of the track should be left unbarricaded.

The work on these three blocks was done in three sections of one block each, one at a time, and was in the nature of a trial to determine the feasibility of two slightly different plans employed.

The old track was built many years ago. It consisted of two concrete stringers running lengthwise directly under the rails with a concrete paving base in between the stringers to support the paving. Imbedded in these stringers at intervals of approximately 5 ft. were cast-iron chairs, on which 9-in. grooved girder rail was supported and held in place by clips. The theory of this early construction was that new rail

could easily be relaid by removing the clips and placing the new rail on top of the old chairs. With the passage of time, however, the entire track, stringers and paving base had settled under the weight of traffic in an irregular manner from 1½ to 3 in., depending on the density and nature of the sub-base in the different portions of the street. In order to use the old concrete stringers the new track had to be brought up to grade.

The differences in elevation due to settling, added to the 1½ in. difference between old and new rail heights, made necessary the use of a tie that could meet the following specifications: extreme shallowness, satisfactory bearing area for the rail base, largest possible bearing area of the tie on the concrete, and reinforcement of the whole concrete structure. For this reason the company's engineers decided to use International steel twin ties.

THE FIRST BLOCK

After the paving contractor had finished the work of removing the old granite blocks between the rails, and for a distance outside of the rails that would allow for the installation of ties, engineers took numerous elevations to determine the amount of chipping that would be necessary to install the steel ties. The chipping

ping of the concrete was done with pneumatic tools in a comparatively short time because the track had settled considerably in this block and only a few spots remained high.

The new rail, a 7½-in. girder tee section, was then distributed end to end along the side of the street reserved for the track-work, and all joints were thermit welded prior to fastening the rail to the ties. Rail clamps were used to hold the rail ends for welding. At the end of each block of welded girder tee rail, a 5-ft. section of 9-in. girder rail was welded to make a compromise joint. The outer ends of the 9-in. girder sections were drilled for bolting to the old rail at the intersecting streets. When the welding and drilling were completed there were two continuous sections of rail, each as long as the block, lying on the shoulder of the street ready for placement.

After the trench was prepared and the rail welded,

were laid on a dry sand and cement cushion on the old concrete stringers. At the same time that the blocking was in progress, the balance of the steel ties were hooked to the rails. Side blocking was also used to maintain the track alignment.

Holes were then made in the plates of the twin steel ties to correspond to the holes in the old cast-iron chairs, and bolts were placed from the chairs through the tie plates so that the track could easily be held down by tightening up on them. The track was then brought accurately to grade by wedging under the rail on the wood blocks in the cement and sand cushion and pulling down on the anchor bolts fastened to the chairs. All this was done under a traffic which varied from 56 cars per hour during the rush period to 40 cars per hour during the non-rush period.

Due to the uneven settlement of the old concrete stringers, there was a space under the bottom of the



Rapid Work Characterized This Philadelphia Track Reconstruction

No. 1. The first block completed made an excellent job.

No. 2. No time to waste. After a car

passes, workmen pick up their tools and proceed. Here men are removing a few remaining high spots with pneumatic picks.

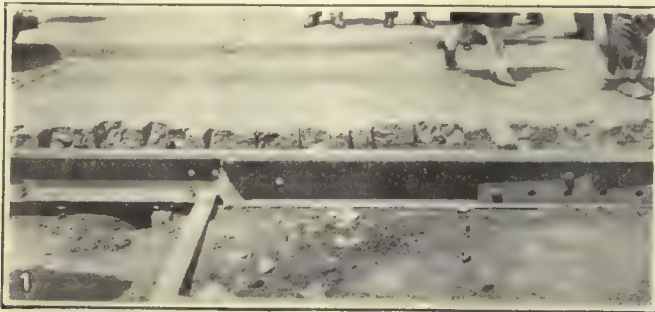
No. 3. The third block stripped of paving between the rails and to the curb on one side, ready for the replacement of new rail.

preparations were made to cut in the new track at night, this being the only operation contemplated to interrupt traffic. At each end of the block the rail heads of the old track were saw-cut for the connection, the rest of the cut being done by torch. When the old rail was burnt into convenient lengths and removed, 4-ft. pieces of old wood ties were placed in the trench on about 20-ft. centers, and the steel ties placed on 5-ft. centers to correspond with the locations of the old chairs. The long sections of welded rail were then pulled by means of a chain attached to the draw-head of a street car, about 15 ft. up the street to a point exactly opposite the cut-in joints on the old track. They were immediately snaked into position to approximate gage, the short pieces of old wood ties acting as supports. As soon as the end joints were partially bolted and a few steel ties hooked to the rail to hold the gage, traffic was resumed. The balance of the construction was done under traffic.

At this point the short pieces of wood ties were removed, and in order to get approximate grade were replaced by wood blocking 6 in. x 9 in. and from 2 in. to 4 in. thick every 5 ft. under the rail. These blocks

twin steel tie plates varying from 4 to 6 in., this being greater than desired for proper concrete tamping. In order, therefore, to provide a tamping pocket from 1½ to 2 in. deep under the plates of the tie and under the rail, a layer of concrete was poured on top of the old stringers and half way up the channel of the tie, mixture of 1:2½:5 being used. This concrete was poured at night from 11 p.m. to 2 a.m. and was made with Lumnite cement so that it could acquire its initial hardening under traffic on the night schedule of about a twenty-minute headway. At 9 o'clock that same morning, this concrete was apparently as hard and strong as portland cement would have been in two weeks, and, since it covered the bottom leg of the channel of the ties, it acted as an additional hold down for the track.

After carefully observing the track for any deflection due to imperfections in this partial concreting which gripped the tie, the tamping process was started. A 1:3 mix of Lumnite cement and traprock screenings was shovel-mixed and hand-sprinkled, wet enough to stick and pack hard, but not sufficiently so to puddle any free water when tamped. This tamping material was placed under the plates of the steel ties and under the



Extremely Shallow Ties Were Essential in Expediting the Reconstruction and Utilizing the Old Concrete Foundation

No. 1. Five-foot section of 9-in. girder rail thermit welded to the end of the new stretch of 7 1/2-in. girder tee-rail, thus making a welded compromise joint.

No. 2. Method of holding down twin steel tie to cast-iron chair of the old substructure.

No. 3. Rebuilding a block of track under severe traffic. Every few seconds a car passes and a steady stream of vehicles is always moving on the open shoulder of the street, which was at all times open for traffic.

No. 4. Where a thermite weld, a cast-iron chair and an International steel twin tie meet. The tie plate was cut out slightly to allow the weld projection to drop below the plate.

rail itself throughout the entire length of the track. It was both hand-tamped and power-tamped. The tamping was a comparatively simple process, being immediately understood by the crews, who were familiar with the use of pneumatic tampers. The entire block was done between 10 a.m. and 5 p.m. despite heavy car and automobile traffic on the active side of the street.

The job was left in this condition for a day to observe any deflections that might take place, but none were found. After a final inspection the usual 1:3:6 mixture of foundation concrete was poured over the old concrete stringers and ties, and brought up to the level desired for the paving base, which was 6 in. below the surface of the rail. This base allowed for a 1-in. sand cushion and a 5-in. layer of granite block. A sufficient number of blocks were nose cut for use in providing a flangeway along the gage line. After the blocks were firmly set on the sand cushion, a hot mastic filler, 50 per cent asphalt and 50 per cent sand, was poured between the blocks and the job completed. Mastic filler was used instead of grout in order that immediate use of the street could be made by vehicular traffic.

THE SECOND BLOCK HAD MORE TRAFFIC

The second block adjoining the first had even heavier traffic conditions, as far as the frequency of street cars was concerned, and the transportation department again allowed only 40 minutes in which to remove the old rail and place new rail in position ready to run. The paving was removed from the track area in a manner similar to the first block. The new girder tee rail was previously thermit welded, compromise joint sections were made on the ends similar to those in the first block, and the whole block of rail thus made ready to be snaked into place.

Because the concrete stringers had not settled to such an extent as in the first block, the steel ties were constructed in a manner to give them less depth. This was accomplished by riveting the cross channels flat, instead of vertical, making a total depth of tie of only 1 1/2 in. This saved considerable chipping of concrete.

In order further to economize on the time allowed, and resume traffic at the earliest possible moment, full-length old wood ties on 20-ft. centers were used in this block for spiking the rails temporarily to gage. As another means to save time, the holding-down bolts on the old rail were burnt off and the rails snaked out in single lengths a block long onto the vehicular side of the road, which was closed for a few of the early morning hours. The rail was then cut with the torch into 30-ft. lengths and hauled away. Traffic was resumed at this point and the work of hooking on the steel ties, blocking up the track, removing the temporary wood ties, etc., was carried on as before.

As there was less settlement in this block it was not necessary to construct tamping pockets, since the intervening space between the top of the old concrete stringers and the undersides of the tie plates was about correct. Because of the lesser settlement in this block the tie channels of the steel ties were bolted to the plates on the flat side of the channels, thus making the depth of the tie only 1 1/2 in. In this way considerable chipping of the old base was avoided. As soon as the track was firmly bolted down to the old chairs and brought up to grade, power tamping of the Lumnite cement and traprock mixture was carried forward. After letting the track remain in this condition for a

day to observe possible settlements or failures, the paving base concrete was poured and the paving laid. In this block the paving base concrete was made of Lumnite cement instead of portland.

THE THIRD BLOCK

The third block was handled in the same manner as the second, as this method proved to be the faster and allowed for greater salvage of the old concrete base.

The foregoing experience in track renewal work has proved to interested parties that wherever there is an old concrete base on which track can be built of steel ties and Lumnite cement, economical reconstruction of track is possible under heavy traffic conditions without disturbing the operation of cars for more than one short period at night.

The several views reproduced show the work in its various stages and indicate the possibilities of such reconstruction methods under dense traffic conditions.

Accident Prevention Bonus for Brooklyn Trainmen

AN ACCIDENT prevention bonus plan under which motormen, conductors and safety car operators will receive a bonus of \$5 for each 30-day working period in which they operate their cars without an accident has been established by the Brooklyn City Railroad, Brooklyn, N. Y.

The awards will be distributed to employees on Dec. 15 of each year, so that motormen, conductors and safety car operators with clear records for one or more 30-day working periods will collect Christmas dividends on their records for safe operation.

The rules governing the accident prevention bonus plan were announced by C. E. Morgan, vice-president and general manager of the company, as follows:

The Brooklyn City Railroad will on Dec. 15 of each year pay to each conductor, motorman and safety car operator in service on that date the sum of \$5 for each 30-day working period complete on or before Nov. 30 of each year during which such employees operate their cars without an accident.

It is understood that the term 30-day working period does not mean a calendar month, but refers to days actually worked (excluding days off). To receive credit for a working day, conductors, motormen and safety car operators must work at least eight or more hours. Further, such employees will only be entitled to bonus money earned since last date of appointment or reappointment.

In case conductors or motormen or safety car operators have accidents occurring in, on or around their car and fail to report same as required by the operating rules, any conductor, motorman or safety car operator who becomes involved in such no report case shall automatically lose the bonus for the particular period of 30 days in which the date of the accident is contained, in addition to being subjected to other disciplinary action.

On two-man operated cars the conductor and motorman, as far as accidents are concerned, will be considered a crew. Any accident of any nature in which their car is involved during their tour of duty will be charged against both the conductor and the motorman in charge of such car.

All accidents of whatever nature occurring in, on or around their car will be charged to conductors, motormen and safety car operators except such accidents as can be clearly defined as not being the result of any action or lack of attention to duty of such conductor, motorman or safety car operator. This responsibility to be finally determined by the management after full investigation of the accident and contributing causes thereto.

It is therefore important in all cases that employees secure the names and addresses of all possible witnesses, as the statements of these witnesses will be one of the large factors in determining the responsibility for the accident.



Various Stages in the Rebuilding of the Track on North Eleventh Street, Philadelphia

No. 1. Old rail on North Eleventh Street, Philadelphia, ready for removal. On the right may be seen the new rail thermite welded ready to be placed. The change was made at night almost between two owl cars, the delay to street car traffic while the old rail was removed and the new rail installed being only 30 to 50 minutes.

No. 2. With the new rails and twin steel ties in place, the track was brought to line and grade. The tie plates were bolted down to the cast-iron chairs of the old construction, and held up by blocking and wedges every 5 ft. Alignment was obtained by blocking against the highway road shoulders. Due to the fact that this old street surface had sunk several inches, the steel ties channels were bolted to the plates on the side of the channels the normal construction of this tie.

No. 3. In this block the old street surface had not sunk so far, and the tie channels were bolted on the flat side to avoid excessive chipping of the old sub-base. The job as illustrated is ready for the tamping of the dry mix, under the steel tie plates to align the track.

Buffalo & Erie Demonstrates Magnetic Brake

Railway Executives, Public Officials and Manufacturers' Representatives Witness Tests on Single and Double-Truck Cars

DEMONSTRATIONS of the effectiveness of the new type magnetic brake which has been applied to all of its cars by the Buffalo & Erie Railway Company, were made in a series of tests on Tuesday, Aug. 17, at which approximately 60 railway executives, public officials and manufacturers' representatives were the guests of the Buffalo & Erie property. This brake, which is operated by direct trolley voltage in combination with the safety devices air equipment, was described in detail in *ELECTRIC RAILWAY JOURNAL* for July 17, 1926. The development is the result of an effort by the railway to increase the factor of safety in its operations while at the same time maintaining maximum possible speed with light, economical and comfortable equipment. On the Buffalo & Erie property, fast operation is complicated by numerous grade

the stopping distance and stopping time for emergency air brake applications alone in comparison with the combination of air and magnetic brakes. The tests were carried out on a single truck car and on a double truck car of the company's standard type, weighing approximately 37,500 lb.; first, with normal rail and then with 1,075 ft. of both rails covered with oil. In all cases, reservoir air pressure was approximately 70 lb. Results of the test are as follows:

BUFFALO AND ERIE BRAKE TESTS						
Car	Brake	Rail	Speed-m. p. h.	Time to Stop Seconds	Dist. to Stop Feet	Reduction Time Dist.
Single truck	Air only (emergency)	Normal	21.4	7.4	141.0	.....
Single truck	Air and mag (emergency)	Normal	22.0	4.8	97.0	2.6 44.0
Double truck	Air only (emergency)	Normal	48.0	17.0	685.0	.....
Double truck	Air and mag (emergency)	Normal	47.1	12.2	493.0	4.8 192.0
Double truck	Air only (service)	Oiled*	47.1	32.5	1475.0	.....
Double truck	Air and mag (Service)	Oiled*	45.4	20.2	761.0	12.3 714.0

No sand used during tests.

*Both rails oiled for 1,075 ft.

At the completion of the tests, the visitors were entertained by the railway at the Shorewood Country



Some of the Electric Railway Executives and Manufacturers' Representatives Who Witnessed Demonstration of New Combination Air and Magnetic Brake Developed by Buffalo & Erie Railway

Reading from the left to the right: F. A. Nichols, general manager, C. G. & P. Railway; W. W. Oskert, Buffalo & Erie Railway; W. G. Stuck, superintendent of equipment Kentucky Traction & Terminal Company; A. L. Kasemeier, vice-president Cincinnati Car Company; C. M. Harrison, superintendent Northwestern Electric Service Company; F. W. Bacon, vice-president International Utilities Cor-

poration; K. Connor, superintendent of equipment Jamestown, Westfield & Northwestern Railroad; A. Davis, air brake engineering department General Electric Company; J. P. Vernor, Westinghouse Electric Company; R. B. Miller, Stark Electric Railroad; R. W. Palmer, General Electric Company; C. J. Ellis, Cincinnati Car Company; W. R. Goodknight, master mechanic Buffalo & Erie Railway; E. W. Sweezy,

Stark Electric Railroad; G. J. Baker, superintendent Buffalo & Erie Railway; P. J. Wood, master mechanic Erie Railways; Leon Johnson, general superintendent Jamestown, Westfield & Northwestern Railroad; George MacLeod, vice-president and general manager Buffalo & Erie Railway; Daniel Durie, West Penn Railways; Henry Bush, superintendent of transportation, Kentucky Traction & Terminal Company.

crossings and many miles of trackage either on or immediately adjacent to a heavily traveled highway.

Ability to stop a car in minimum distance and time without serious inconvenience to the passengers has been considered the most effective means of increasing safety without sacrificing the all important element of speed. Results obtained during a period of a month since the magnetic brakes have been applied to all of the company's cars indicate the value of the improved brakes in actually reducing vehicular accidents. During this period since all of the cars have been equipped, there have been only two such accidents—comparatively minor in nature. In the corresponding period last year, there were seventeen accidents of this character.

Three sets of demonstration tests were made for the visitors. In each case measurements were made of

Club. F. C. Bacon, vice-president of the International Utilities Corporation, owners of the property, and George MacLeod, vice-president and general manager Buffalo & Erie, acted as hosts. Commenting on the significance of the tests, Mr. Bacon pointed out that ability to control rapidly moving equipment at various speeds is a vital factor in the continued improvement of railway service. He explained that a careful analysis of accident statistics on the Kentucky Traction and Terminal property had shown that front end accidents could be reduced 72 per cent, provided the braking rate could be increased from 30 per cent to 35 per cent. It was this study, he said, which led to the present improvement. Mr. Bacon complimented the Cincinnati Car Company and the General Electric Company for their co-operation in working out the new equipment.

Choosing Materials for Railway Motor Commutators

Use of Hard-Drawn Pure Copper Bars and Mica Strips With a Dry Bond Are Two Essential Factors That Helped to Solve the Problem of Preventing High Bars

By *Jesse M. Zimmerman*

Renewal Parts Engineering, Westinghouse Electric & Manufacturing Company

IN THE early days of railway motor manufacture, a world of grief was experienced with commutators and commutation. When the motors were placed on test, some commutators developed high bars. Then the motor had to be dismantled, the commutator tightened, and the face "re-turned" before the machine could be put into service. Sometimes the commutator had to be tightened two or three times. The unfortunate part was that some of the motors developed high bars after they had been in service but a few months. Those who passed through these days of trial considered them as a real "Waterloo" for railway motor commutation.

Our failures and difficulties made us search ways and means to overcome them. This search has resulted in five superior features in manufacture, namely, mica strips with a dry bond, hard-drawn pure copper bars, correctly molded mica V-rings, increased mechanical strength of the spider and details and an increased knowledge as to the accuracy required to machine commutator Vs.

POOR MICA STRIPS CAUSED HIGH BARS

In the early commutators, the mica strips were made of mica plate having a high bond content. The mica plate was made of high-grade mica splittings, but the methods of making mica plate were less advanced. During this same period, the commutators were made arch-bound. When the commutator was going through the seasoning period, the bond oozed out from between the bars. This caused the mica to shrink, relieving the arch-binding between the bars. The seasoning process did not harden the bond completely. Therefore, the bond continued to ooze out when the motor went into operation. Due to the centrifugal force, the bars rose where the bond had oozed out excessively. It was evident that one of the difficulties was due to the mica strips.

Design engineers made a search for an insulating strip which was adapted for commutator service. Asbestos was one of the numerous insulating materials tried. It was found that a mica plate with a low bond content which was properly seasoned was superior to all other materials tried. The mica strips used in the present-day railway motor commutators should be made of mica plate described as follows:

The mica plate is made from selected pure white splittings, usually about 1 mil thick, free from clay spots, metallic spots, cross grains, heavy edges and heavy pieces. They are held together with a minimum quantity of dry bond, which will flow at a medium

temperature. The advantage of the "dry method" is that it permits the use of a bond which does not contain alcohol as a solvent. Alcohol is dangerous because it does not evaporate completely. When mica plate containing alcohol is used in a commutator, the alcohol may evaporate and migrate to some part of the commutator and condense. This sometimes occurs at the point of the Vs producing a weak spot in this location.



Mica Strips as They Are Most Conveniently Supplied for Repair Purposes. At Left, Rectangular Piece Sawed to Length. At Right, Punched Mica Strip

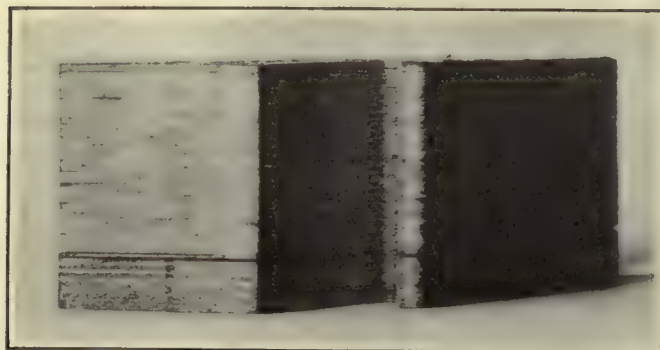
Great care is taken during the pressing operation to insure uniform density. Special pads are placed between plates to obtain this result. The mica plate must pass through a seasoning operation which serves to make the bond infusible. It is milled with an allowable variation of plus or minus 0.0010 in. If the variation exceeds this value, the distance from any bar to the corresponding bar under the next pole may vary more than plus or minus $\frac{1}{32}$ in. Mica plate will compress a certain amount when the assembled segments are heated and drawn tight with the clamping ring. This compression factor must be taken into consideration when milling the mica plate.

All finished mica plate should have a surface coat of pure orange shellac. It has the following advantages: (a) It prevents flaking and scaling of the mica splittings in handling and storage. (b) It keeps the mica plate free from dirt and moisture while in storage. (c) It tends to reduce oil and moisture absorption when the commutator is in service. The shellac cements the adjacent bars to the mica strip, thus reducing the creepage of oil and moisture along the copper bar. (d) It facilitates assembling. By heating segments before the Vs are machined the shellac glues the segments together. Therefore, when the banding wire is cut they remain in a firm body and will not fall apart. This makes it possible to assemble the parts of a V-bound commutator without skewing the bars.

Mica plate should not absorb more than approximately 0.75 of 1 per cent of its own weight of oil when placed between two commutator bars under working pressure and immersed in oil for 24 hours. It should

also stand a pressure of 10,000 lb. per square inch when heated to 150 deg. C. without showing a slippage of mica or squeezing of the bond.

A good means for testing mica strips, to determine whether the bond has been properly seasoned, is to place a dozen strips between two parallel steel bars which have a bolt at each end to exert a clamping action. The steel bars should be strong enough so that they will not bend. After the strips have been placed between the bars, under pressure, their thickness should be measured cold. Then they should be heated to at least 150 deg. C. A flame should not be allowed to strike the strips, as it will consume the bond. When they are thoroughly heated the bolts should be tightened to the same pressure as that originally used and the whole should then be allowed to cool. The thickness of the



Two Sets of Mica Strips After Having Been Heated and Pressed Under Identical Conditions

Those above show that the bond was properly seasoned and that the slippage of mica and the oozing of bond was negligible. Those below show visible signs of slippage of mica and oozing of bond. This is an indication that the bond was not properly seasoned.

assembled strips should again be measured to determine the amount of compression. Absence of slippage of mica or oozing of bond is an indication that the bond was properly seasoned. If the bond squeezes out, the strips are not fit to be used in a commutator.

A photograph was taken to show two groups of mica strips after they had been under identical tests. Group No. 1 shows no effect due to compression because the bond was properly seasoned. Group No. 2 shows the slippage of mica and the oozing of the bond. This is an accurate illustration of how the two types of mica plate will act after they have been in the commutator. It is well for railway operators to give mica plate the test outlined before it is used for repair.

The question of how to order mica strips for repairing commutators has been asked by many railway operators. The manufacturer of the original commutator will supply mica strips either punched to an unfinished size or in rectangular pieces. When the Vs and necks of the copper bars are punched for manufacturing pur-

poses, the mica will be punched in the same manner. This mica die will leave $\frac{1}{8}$ in. material on each side of the V for finishing purposes.

When the mica strips are received in punched form, they can be finished very easily by pasting the strip to the copper bar with shellac. When the shellac is dry, the two should be placed in a vise with the mica strip toward the workman. The Vs can be cut to the same size as the copper Vs. In cutting, the stroke of the knife should be toward the copper. In this manner the mica will cut without tearing. It may be necessary to take a finishing cut with a knife file. If so, the file should be handled in the same manner as the knife.

When the sale of a certain commutator is small, it does not pay the manufacturer to make a die for punching the Vs and neck in the rough, for it is cheaper to make the commutator from the rectangular copper bars and mica strips than to make a set of punching dies. Where this condition exists the mica strips will be rectangular for repair purposes. When rectangular mica strips are received it is best to paste each to the bar with which it will be used. The V can then be cut.

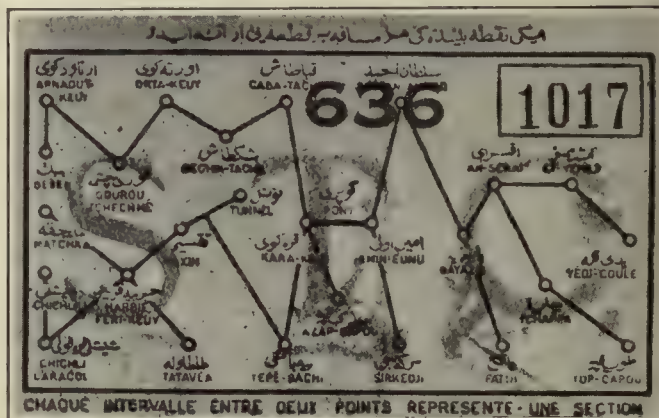
It is impracticable to finish the mica strips to exact size because it would have to be done by hand to template. Since the method of finishing them, when the finished bars are available for use as a template, is so simple, the extra cost for labor would not be warranted.

When a complete commutator is to be refilled, a set of mica strips will be required. It is best to purchase the mica in either of the previously mentioned forms.

After the Vs have been finished the mica strips should not be removed from the copper bars but assembled while they are stuck together. After the commutator has been assembled cold the bars should be aligned properly and the commutator heated to a temperature of from 125 deg. to 150 deg. C. While hot and under pressure the tightening can be done satisfactorily.

System Map Shown on Transfer

BECAUSE of the cosmopolitan nature of the population of the city, the Société des Tramways de Constantinople, Turkey, has found it desirable to print on the face of its transfers a complete map of the system, rather than to rely solely upon a list of transfer points. Zone fares are charged as is common on European tramways, and the limits of each section are indicated on the transfer by small circles, as shown in the accompanying illustration. Names are printed in both French and Turkish.



Layout of the Entire Tramway System of the City of Constantinople Is Shown on the Face of the Transfers

Four-Door Single-Ended Car for Montreal

An Interesting Type of One-Man, Two-Man Car with Special Provisions for Operating in Very Cold Weather—These Include Side Construction with Steel Plates on the Inside and Plymetl Outside for Insulation, a Different Door Combination for Cold Weather, Etc.



Each Platform of These Cars Has a Door for Entrance and a Door for Exit, but the Rear Door on the Rear Platform Is Used Only with Two-Man Operation

FIFTY cars of a novel type for single-end operation are being put in service in Montreal by the Montreal Tramways. The first car of this order was completed by the Canadian Car & Foundry Company toward the end of last month and appeared on the streets in Montreal a few days later. Delivery of the other cars on the order will follow shortly.

The chief objects sought in this car were as follows:

1. Minimum weight, consistent with sufficient strength and rigidity for long life under general service conditions.
2. Minimum deterioration and low maintenance cost,
3. Large seating capacity with comfortable, sanitary seats.

4. Easy riding qualities combined with freedom from noise and vibration.

5. Automatically regulated heating equipment, full safety devices and automatically controlled braking apparatus.

6. Attractive external appearance with noticeable color feature to distinguish this type of car from others in service on the same route.

7. Full provision for one-man operation in regular service, with rear vestibule construction to permit of rapid, inexpensive adoption for standard two-man operation, if required.

The principal dimensions of the new cars are given in the table on page 294.

PRINCIPAL DIMENSIONS OF MONTREAL ONE-MAN, TWO-MAN CARS

Length over all.....	41 ft. 2 in.
Width over all.....	8 ft. 3 in.
Truck centers.....	17 ft. 7 in.
Wheelbase of trucks.....	5 ft. 4 in.
Diameter of wheels.....	26 in.
Distance top of rail to top of step.....	15 in.
Distance top of step to top of step well.....	11 in.
Distance top of step well to top of car floor.....	6 1/2 in.
Height top of roof above top of rail.....	10 ft. 8 1/2 in.
Weights:	
Car body.....	15,200 lb.
Trucks.....	10,000 lb.
Equipment.....	8,800 lb.
Total.....	34,000 lb.
Seating capacity:	
One-man.....	45
Two-man.....	44

UNUSUAL DOOR COMBINATION

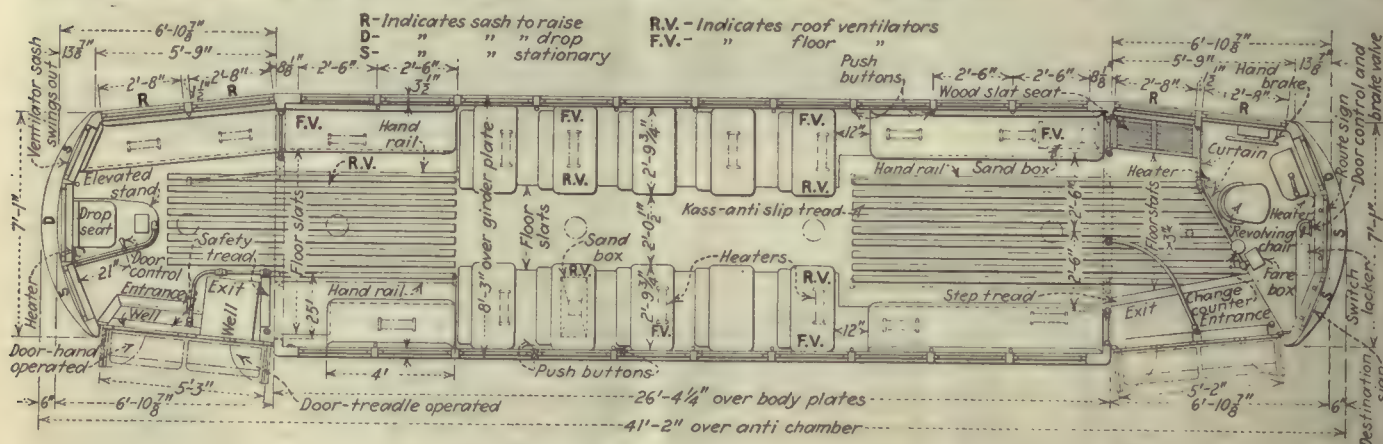
The most striking feature of the floor plan of this car, which is single ended, is the use of four doors, two at each end, one for exit and the other for entrance. Three of these doors are air-operated, but the rear door on the rear platform is hand-operated, being limited in its use to providing an entrance only when the car is being operated by two men. At that time, the conductor occupies a position on the elevated stand shown at the rear of the car. A portable fare box is placed in the holder directly in front of him.

Since these cars will be known by their distinctive

visors, whose sole duty will be to invite transfer passengers to enter the car at the rear. Having no other duties to perform, such men can quickly and efficiently examine and collect transfers, relieve the operator of this work and provide a short-cut to that part of the car which is usually the least crowded. It is believed that such an arrangement will result in quicker handling of passengers than is now accomplished by regular two-man operation.

At terminals also where there is a prepayment area or where there are street collectors, passengers may be admitted to the car through the rear door. At other times, the rear door of the rear platform is closed and passengers enter the car through the front door of the front platform. The fare box is on the barrier on the side nearest the operator. There is also an aluminum change plate on the barrier and a lamp to illuminate the change plate at night.

Passengers in one-man operation can leave through the doors adjacent to the body on either the front or rear platform. The latter, as already explained, is treadle operated. Each of these exits is protected by a light aluminum pipe swinging gate, as already mentioned. This gate is fitted at the bottom with a closing device with oil dashpots. The lower bar of this gate



Plan of Four-Door Single-Ended Car of Montreal Tramways

color as one-man front-entrance cars, passengers will be accepted at all times at the front end. At crowded corners where loading is heavy and time is of importance, passengers will be invited by a street supervisor or inspector to board the car at the rear end.

The exit door on the rear platform is treadle operated at all times. The mechanism is so arranged that it cannot be operated until the air brake valve is in "door open" position. The motorman's light signal is controlled by the rear doors only, and if a motorman should attempt to start his car when a rear door is open the brakes are automatically applied in emergency position.

The aisles leading to the exit doors on front and rear platform are protected in each case by an outwardly swinging gate to be described later. All barriers are of aluminum piping with wood filler.

DESIGNED FOR ONE-MAN OPERATION

The company expects that the usual operation of the car will be by one man only. Two-man operation may be adopted for one or two trips per day during the rush hour on certain routes. The management believes that the only assistance that need be given to the operators of these cars when in one-man service is the use at four or five congested points of ground men or street super-

is 17 in. above the floor and the upper bar 14 in. above the lower bar. On the outside of the gates are the words, in three lines, "No passage defendu." This is to warn boarding passengers that this passageway is for exit only. Incidentally, it might be said that all car signs in Montreal have to be in both English and French, and in this expression the middle word, fortunately, belongs to both languages, so that it does not have to be repeated. On the inside of the gate are the words "Exit; sortie." All doors are of the double folding type and all except the rear door on the rear platform are pneumatically operated. The car framing is arranged so that this rear door can be equipped with a door engine later, if it should be found desirable.

The door control is entirely under the direction of the motorman and is interlocked with the motor control. The combinations possible are:

1. Only the front entrance door open. This is used when there are no alighting passengers.
2. All three pneumatically operated doors open. This is the usual combination with one-man operation.
3. The entrance door and rear exit (treadle) door open. This combination is used with a lightly loaded car during very cold weather as the car is less chilled with two doors rather than with three doors open.

4. All four doors open. This combination is used with two-man operation or with one-man operation only at the end of a route, at a prepayment terminal or when there is an inspector at the rear entrance door.

A special valve has been put on the door engine operating the rear treadle door so that the door will not close until the step is in a vertical position. This avoids any possible danger of the car starting when a passenger has one foot on the step but is resting most of his weight on the ground on the other foot.

INTERIOR ARRANGEMENTS

The seating arrangement, as shown in the plan, provides for five cross seats on each side of the middle of the car and longitudinal seats at each end. The seats are of Hale & Kilburn make. The floor with the exception of the step wells is level from one end of the car to the other.

The flooring in the aisle and in front of the longitudinal seats is of maple strips, with Kass 2-in. anti-slip strip coverings over two of every three adjoining maple strips.

The motorman's seat is upholstered in leather and is of the revolving type. The piping and other operating equipment in the front vestibule are inclosed in a cabinet, leaving only the handles and switches visible. The hand brake is at the left so as to be entirely out of the way of entering passengers. A mirror above the center sash gives the motorman a full view of the car interior. The light switches are within easy reach of his position. One reason for this arrangement of light switches is that a number of the cars pass through a tunnel, and the motorman has to be in position where he can turn the lights on and off quickly.

The interior of the car is finished in cherry with



With Exits at Each End This Car Unloads Very Quickly

green enamel headlining. The handholds are of the sanitary retrieving type. All steps have Kass non-slip treads. The sash is of brass and the ventilators are protected on the inside with a polished brass grill.

CONSTRUCTION DETAILS

The body construction is unusual because the steel side plates are on the inside instead of the outside of the car. The outside of the car is ply-metal sheathing and the space between this sheathing and the steel plates is filled with $\frac{1}{2}$ -in. Salamander heat insulation. The purpose of this form of construction is twofold. One object is to reduce corrosion, because with the low temperatures experienced in Montreal it was found that with the steel plates on the outside condensation would form on the inner side of the plates. The second expected result from this form of construction is that there will be less noise.

The color selected for the exterior differs from that used on the other Montreal cars, which is green with fawn-colored side posts and maroon trimming. The purpose was to make them more conspicuous and immediately recognizable as "front entrance" cars, so the body color selected was cream with maroon trimmings and light brown roof. The lettering on the exterior is kept to a minimum, as the only word used is "Tramways." As this word is the same in both English and French it answers for both languages.

TRUCKS AND EQUIPMENT

The trucks used were built by the Canadian Car & Foundry Company and are very much like those on the previous Montreal cars, but with some modifications. The changes introduced have been directed primarily toward reducing the number of parts, especially the wearing parts, and keeping down the weight.

The cars have Westinghouse equipment, including variable load brakes, four 510-A 35-hp. motors and K 35-HH controllers. Other equipment, not already mentioned, includes Electric Service Supply Company's compensated lighting fixtures, Cleveland fare boxes, H. B. lifeguards, National Pneumatic door mechanism, Peacock hand brakes, Railway Utility ventilators, Faraday signal system, Rico grab handles, Whipple bump-



On the Front Platform All Piping Is Incased so as to Be Out of Sight. The Motorman Has a Comfortable Revolving Chair

ers and Consolidated thermostatic control, with the latest type of visible thermostat. The heating equipment on forty of the cars will be the open coil type of heater of the Consolidated Car Heating Company. Five of the cars will be fitted with the new type of Consolidated inclosed heater with G.E. sheath wire heating unit and five cars of the 50 on order will be equipped with Chromolox heaters of the Railway Utility Company.

SPECIFICATIONS

The following are extracts from the specifications for these cars:

Body Construction.—1. The body construction throughout shall be such that no closed unventilated or undrained pockets or recesses will be formed where moisture can collect or water stand.

2. The surfaces of all wood or metal, whether exposed or hidden, in contact or otherwise, shall be thoroughly prepared and properly protected from rust and decay by the application of protective coatings in the manner called for in that section of these specifications covering the painting of these cars.

3. Both internally and externally the cars must have an attractive appearance. All external contour lines should be as nearly continuous as possible from end to end of car. Offsets should be avoided as much as possible. Roofs shall be plain arch design with hoods tapering gradually to give a pleasing appearance.

Care must be taken to see that main side girder is straight and true and that exterior ply-metal panels on sides present, after completion, a true and uniform appearance perfectly free from waves or buckles.

Front Vestibule.—As these are the first cars of this type to be operated in regular service on the Montreal Tramways system particular attention is to be given to the design of the front or motorman's vestibule with a view to the comfort of the operator who is to be called upon to perform extra duties. This part of the car shall have the following features:

1. Portion of vestibule floor as shown by one of the drawings shall be on the same level as car body floor, the remaining portion being 8 in. lower, forming a well at both entrance and exit doors.

2. A comfortable revolving seat shall be provided for motorman and so located that he shall have perfect vision and can, if necessary, comfortably and efficiently discharge all duties of his position without rising from his seat.

3. All piping, valves and hand brake apparatus in front vestibule shall be completely inclosed so as to obtain a neat clean appearance and so that only operating levers, gages and other necessary apparatus shall be visible.

4. All electric switches shall be completely inclosed in suitable steel fireproof box. Switches shall be fully insulated from the box and from each other and properly marked.

5. Provision must be made for sufficient heating in this part of the car to enable the operator to discharge all duties in comfort.

6. Center front and right front windows shall be fixed and all windows of front vestibule shall be permanently weather stripped.

Bottom of pockets for drop sashes fitted with rubber cushions for windows to stop against.

Rear Vestibule.—Rear center sash drop into pocket to facilitate handling trolley from inside of car. All other sashes shall raise.

Headlining.—Headlining to be 1-in. Agasote regular lining in one piece from advertising molding on one side to advertising molding on opposite side and in sections in car length.

Headlining of vestibules shall be in one flat piece from top of door engine box to opposite side of vestibule.

Inside face of headlining shall be painted before erection.

Seats.—Seats shall be Hale & Kilburn stationary, pressed steel, with 10-in. pedestal rattan covered, to meet the following requirements:

(a) Rattan must be of best commercial quality obtainable.

(b) Springs shall be of first quality, steel, uniformly tempered, properly and accurately spaced and securely fixed so as to exert a uniform pressure at all points on the covering.

(c) Filling and rattan must be carefully placed and securely fastened with uniform tension.

(d) A uniform even appearance of car seats is required and the manufacturer shall agree to guarantee the seats supplied for a period of two years of regular service from date of their going into operation.

(e) In order to assure comfortable seats, the angle of the back and shape of seat for all longitudinal and semi-circular seats shall be carefully determined and approved before seats are fabricated.

Car Lighting.—Cars shall be lighted with one circuit of five 94-watt type "K" compensated lamps in series.

Route and destination signs and front steps shall be lighted by one circuit of five 36-watt lamps in series.

Heating.—Cars shall be heated by electric heaters with thermostatic control. There shall be three circuits of six heaters each located as shown on blueprint. Each heater shall have a capacity of 400 watts with a rating of 4.4 amps. at 90 volts. The equipment shall include thermostatic regulators and knife switches and fuses in enclosed box on slate panel.

All heater cases shall be properly grounded.

Insulating Lining.—Between ply-metal outside sheathing and steel side girder there shall be a two-ply thickness of Salamander car insulation securely fastened to suitable supports.

All wiring shall be installed in galvanized steel conduit except the following:

Cable from trolley base to line switch which shall be in flexible galvanized steel conduit where necessary.

Push button wiring in post grooves.

All conduit and conduit fittings shall be of approved type and perfect in all respects.

All conduit shall be grounded with approved clamp terminals.

All conduit must be securely fastened accessible at all points and capable of being quickly and easily disconnected. It must be installed to permit proper draining.

Splicing of cable will be allowed at junction boxes only.

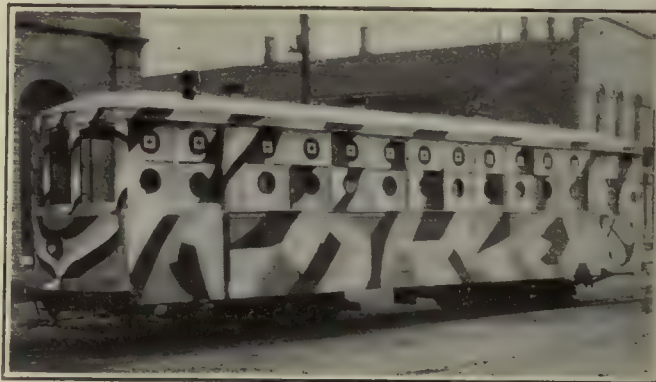
Motor leads must be securely cleated to body of car as close as possible to bolsters.

Motor leads shall be soldered into brass sleeves which shall fit into screw connectors of approved type.

Favorable Publicity from Red Cross Drive

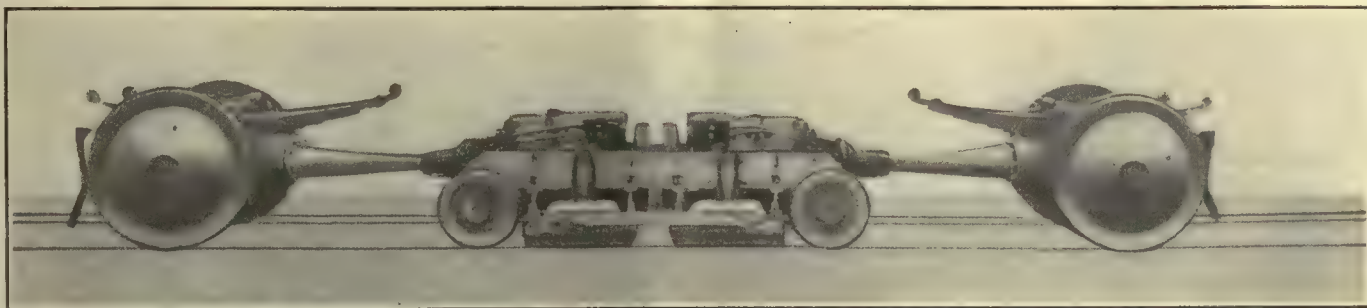
DURING a recent Red Cross Drive in Saginaw, Mich., the railway company took a prominent part with the camouflaged car shown in the accompanying illustration. As a result of this participation in the community activity much favorable publicity and comment was obtained.

On the whole, the work of preparing the car was



Water Colors Were Used to Prepare This Camouflaged Car for a Red Cross Drive in Saginaw. Afterward the Paint Was Easily Washed Off

comparatively inexpensive. A double-truck passenger car was used. This was brilliantly painted in water colors as shown in the illustration. After the parade the car was used by Red Cross workers as a recruiting booth. When the drive was completed the water color paint was easily washed off and the car returned to regular service.



New Type of Electric Car Truck with Cardan Drive

New Theories in Truck Design for Electric Cars Being Tried

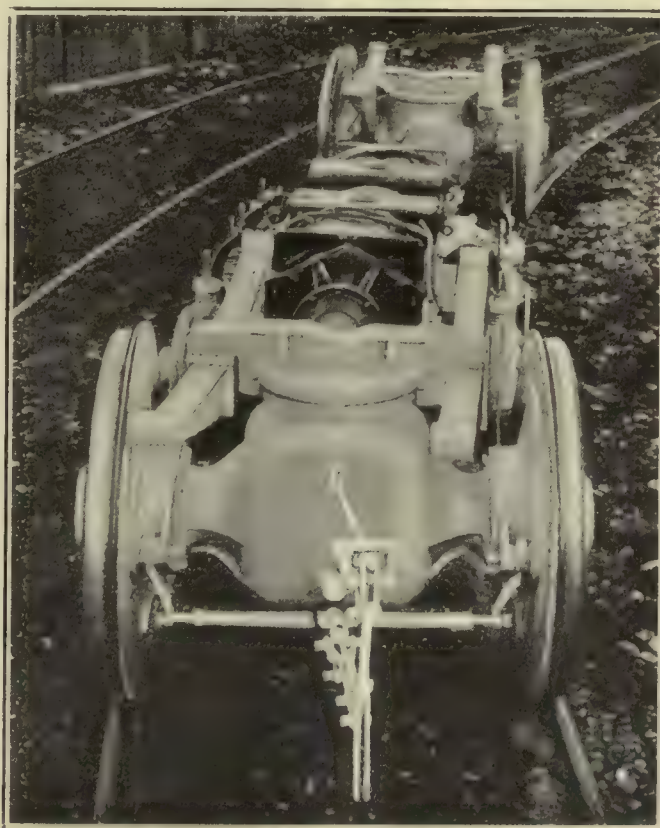
The Motors Are Mounted on a Small Four-Wheel Truck Located Between the Two Driving Axles—Cardan Drive Is Used—Axles Are Divided in the Center so a Wheel Can Revolve on a Curve Slightly More than Its Mate

A NEW truck for electric cars recently placed in service by the Städtische Strassenbahngesellschaft of Zurich, Switzerland, was described in the *Tramway and Railway World* for June 17, 1926. The wheel axles and guiding trucks were built by the inventors, the Swiss Locomotive & Machine Works. Motors and other electrical equipment were furnished by the Oerlikon Machine Works. The car body was built by the Swiss Coach Works at Schlieren. The truck, which has but two driving axles, is provided with cardan drive. A small four-wheel guiding truck is inserted between the two driving axles. This guiding truck supports the two driving motors with a spring suspension. The motors are bolted securely to two longitudinal beams which rest on helical springs arranged above the axle of the truck. The outer motor-bearing shields form a ball-and-socket union together with the radial arm of the driving axles. Small wheels are used on the guiding truck.

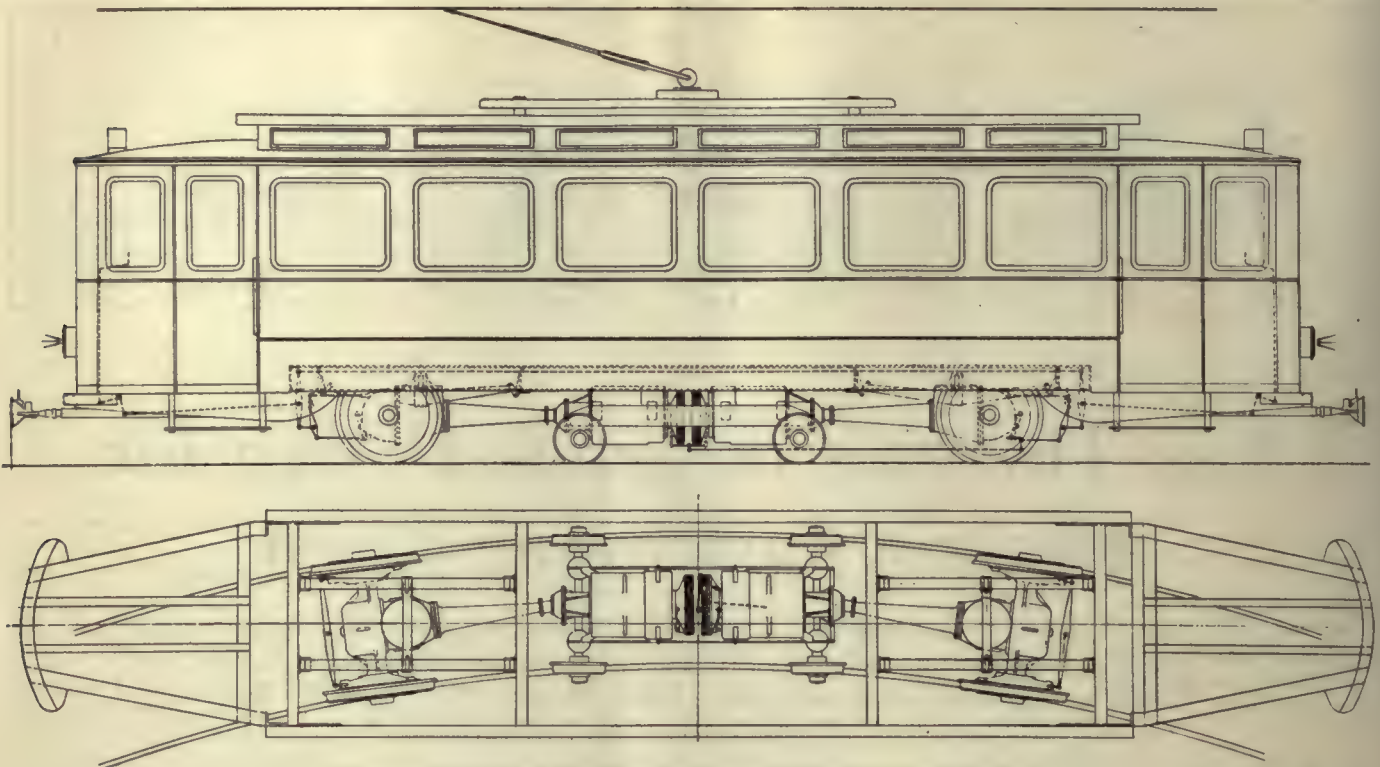
With this arrangement the driving wheels accommodate themselves to curves to a degree not possible when motors are suspended from the axles themselves. In addition, wheel flange pressures on the guiding truck do not develop to any appreciable extent as they are compensated mutually when curves are negotiated. It is obvious from the construction that the total

wheelbase can be increased as desired. As constructed it is 17 ft. 7 in., whereas the wheelbase for the usual type of four-wheel truck seldom exceeds 9 ft. This type of truck is somewhat heavier than the usual four-wheel design, but the total weight when equipped is no greater as the increased weight of the truck is compensated for somewhat, since on account of the higher ratio of transmission between the motor and the driving wheels a considerable reduction in weight of motors is obtained.

Transmission of torque from motors to drivers is accomplished by means of a double gear inclosed in an oil and dust-proof cast-steel casing which bears on the driving axles. The casing is provided with a radial arm connected with one end to the adjusting or guiding truck by means of a ball-and-socket joint. All of the parts subject to wear, such as ball bearings, gears and articulated joints are so cased in as to be absolutely dust-proof. These are lubricated continually by special devices which insure minimum wear of these driving parts. The gear ratio between motor and driving wheel is 9 to 1, which is about twice as great as with the ordinary axle-hung arrangement of motors. All of the supports for the driving axles as well as for the gear wheels and carrying rollers of the guiding trucks are provided with roller bearings of ample size.



End View of Trucks Showing Spring Supporting Arrangement for Car Body

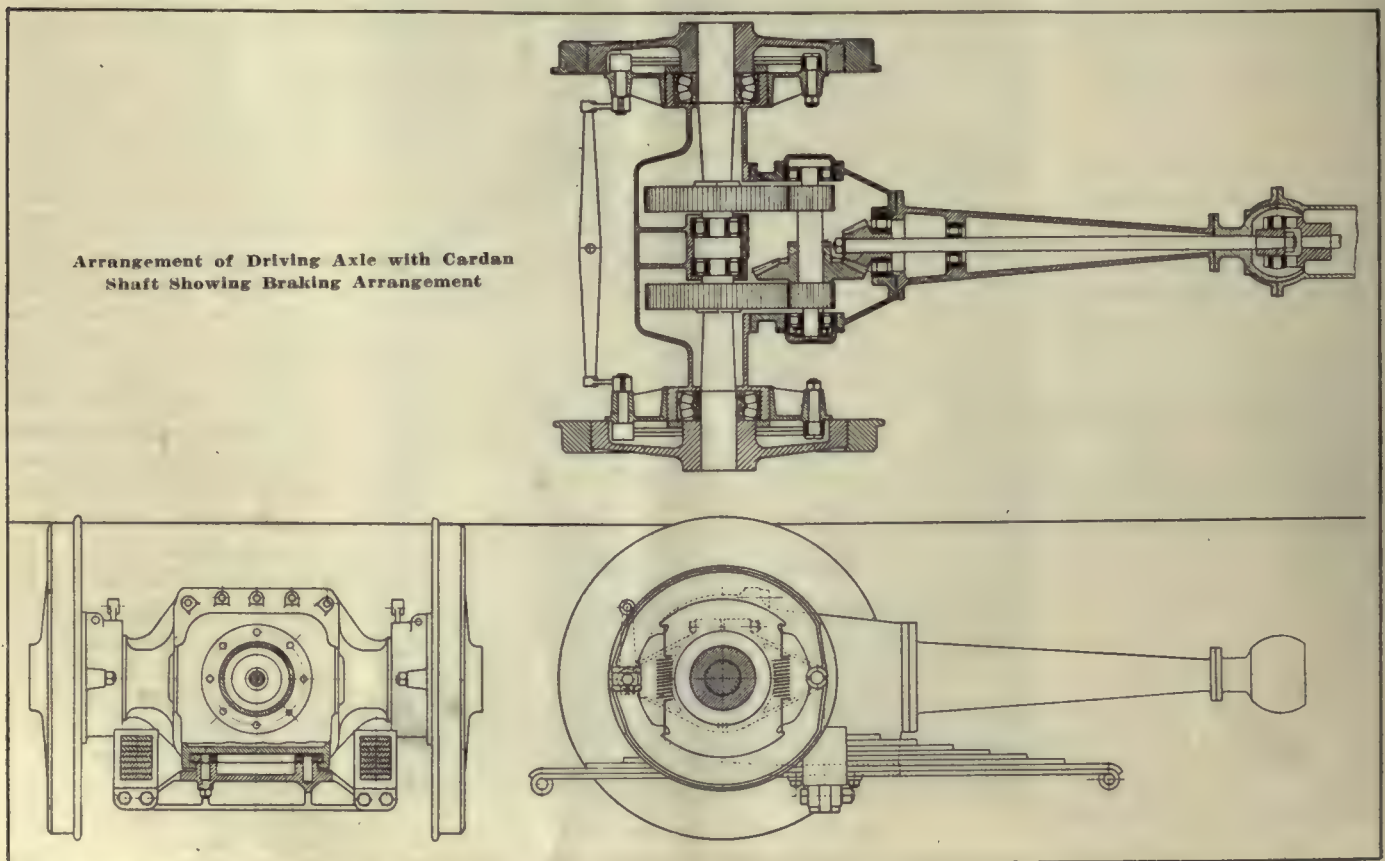


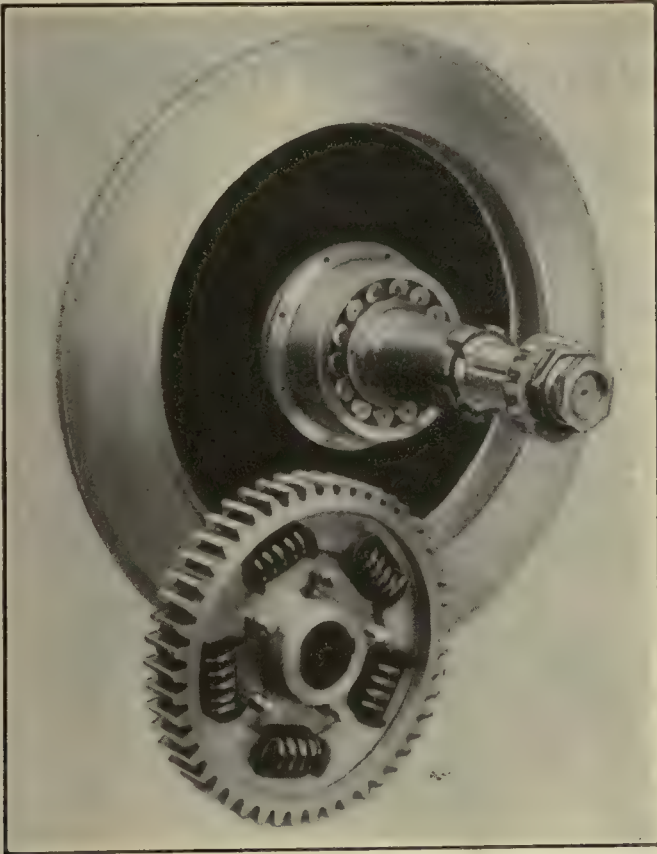
Elevation of Car and Plan Showing Trucks on Curve of 49-ft. Radius

An interesting detail of this new truck is the construction by means of which each driving wheel of the corresponding axle is allowed to displace itself with regard to the opposite wheel. This displacement, however, is limited to a certain angle in the sense of rotation. The idea of this construction is to do away with shrill noises which result when rounding curves and to prevent development of grooves on the wearing surfaces of the rails. Obviously this result would be

attained best by the adoption of a differential gear. The intricate arrangement of this gear and its disadvantages which involves full independence of the two wheels in rotation and the resulting adhesive capacity are reasons for the adoption of a resilient displacement gear. With this device the driving axle is cut in halves, each fitted with a resilient spur gear, which in turn is driven by bevel gearing on a jackshaft supported by the radial arm. The resiliency that results is such that

Arrangement of Driving Axle with Cardan Shaft Showing Braking Arrangement





Driving Wheels Are Provided with Roller Bearings and the Drive to the Spur Gear Is Through Coil Springs

short sections of curves can be negotiated without forcing the wheels to skid on the rails.

The truck is braked at six points interconnected by an absolutely equalized brake rigging. Four out of these six points are inside the driving wheels and two on the ends of the motor shaft. Distribution of brake pressure among these six points is balanced so that no braking forces are transmitted by the gearing; that is, the inertia of the rotating parts is absorbed by the motor brakes alone.

The design of the brake equipment conforms somewhat to automotive practice. By means of a lever and key, the two brake blocks which pivot on the axle are pressed against the inner surface of the wheel. Thus gentle, uniform, but very effective braking results. Brake blocks have ample dimensions and are covered

with "Chekko" linings. This material has given particular satisfaction and is subject to much less wear than cast iron, in addition to producing a higher braking effect. These linings can be replaced easily. By unscrewing a setscrew, displacing a bow and removing the release springs the brake blocks readily can be taken out and replaced. All of the essential braking details except the rigging are protected from dirt. Distribution of brake pressure upon the six points and protection against dust and dirt by tight casings result in a minimum wear of the linings.

The car body rests on two large pivot centers which are submerged in an oil bath and are also well closed in a dustproof casing. The top portion forms a cross-carrier, the ends of which are rigidly connected to long resilient laminated springs, which in their turn are connected to the body by means of eight pairs of pendulum links. The idea of these suspension links is to compensate for the slight reduction of wheelbase when curves are negotiated. They also act as a resilient means for transmitting jerks and kicks imparted to the body lengthwise by the trucks. This feature is of pronounced advantage in providing uniform and easy starting.

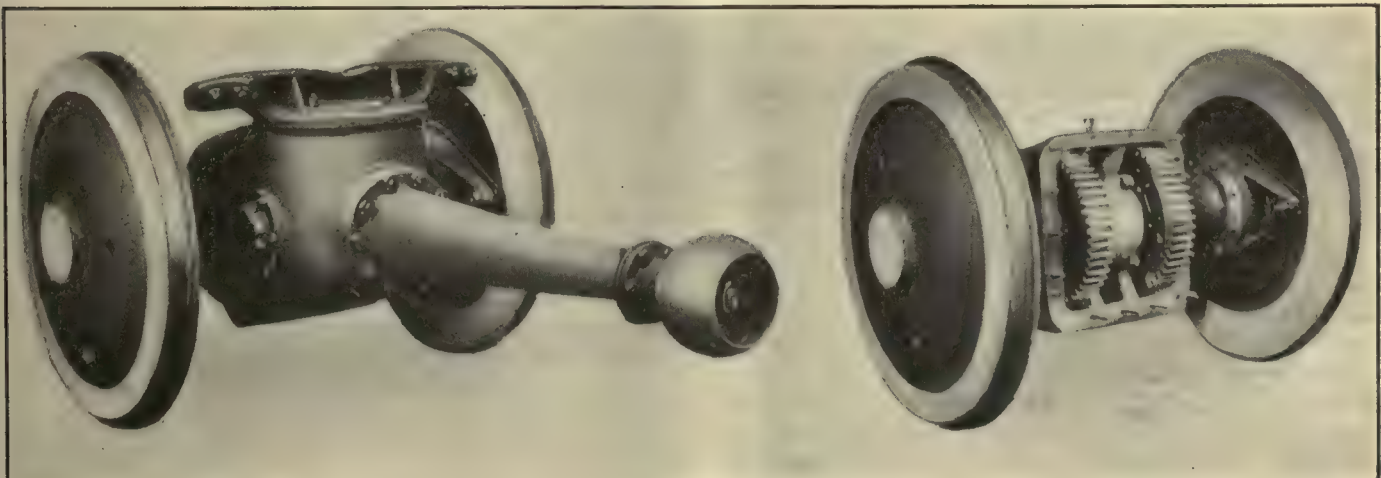
The axles are provided with solid roller bearings arranged inside the driving wheels. These are cased in effectively.

Ductile Welds Developed

TWO methods for producing ductile welds have been developed by research scientists of the General Electric Company. In both processes, air is excluded from the metal by means of a bath of hydrogen or other gas. The formation of oxides and nitrides in the weld metal is thus prevented, and the fused metal is as strong and ductile as the original metal.

One method developed by Dr. Langmuir in Schenectady is to pass a stream of hydrogen between two electrodes. The heat of the arc breaks up the hydrogen molecules into atoms. These combine again a short distance in front of the arc into molecules of the gas, and in so doing liberate an enormous amount of heat, so that much higher temperatures can be obtained with this than with the usual welding methods.

The second process developed by Mr. Alexander makes use of the chemical and physical properties of hydrogen and other gases in their molecular state. This process aims primarily at the prevention of the formation of the nitrides and oxides in the arc-deposited metal.



The Gearing at the Axle Is Provided with an Oil-Tight and Dustproof Steel Casing

The Driving Axle Is in Two Parts, Each Fitted with a Resilient Spur Gear

Causes of Hot Journal Bearings*

An Investigation Was Made in Germany to Determine How Periods between Oilings of Journal Bearings Could Be Lengthened—How Deformation and Displacement of Bearings Could Be Prevented and What Were Some Causes for Hot Bearings

By *Erich Schulze*

Chief Consultant German State Railways, Berlin, Germany

WITH the beginning of general standardization of German freight cars early in 1909, attention was centered upon the car journal bearings because the two-part bearing then generally used gave most unsatisfactory performance. A section of this old journal bearing is shown in Fig. 1. The bearing had top and bottom lubrication, most of the lubricant coming from above, while the lower pad acted chiefly as an emergency lubricator. Theoretically this bearing was well designed. Its only, but grave, fault was that frequent jolts, particularly in yard service, loosened and soon broke the lower part of the journal bearing. In 1909 the German railroads had to replace some 200,000

advantage of this type is that the cover of the journal box is not entirely tight against rain and snow. This construction, therefore, requires continuous attendance, which it may receive on passenger cars, but which is entirely out of the question for freight cars in German service.

After long study, a new journal bearing construc-

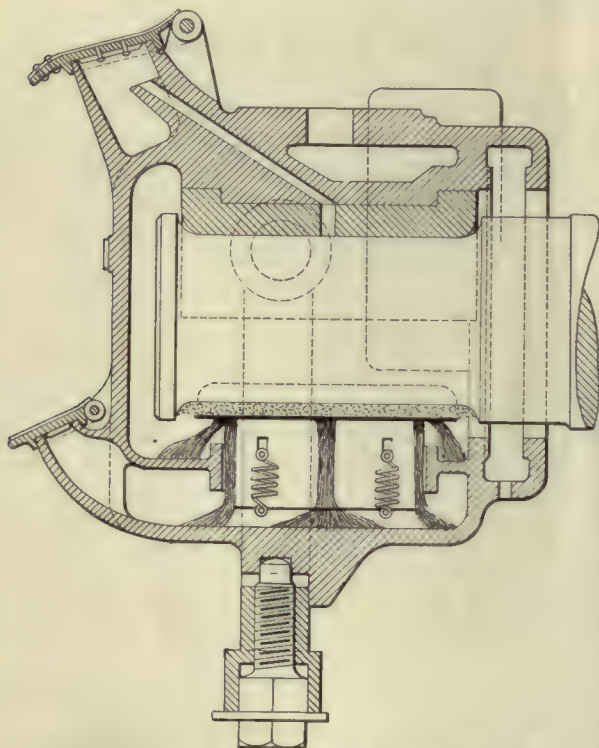


Fig. 1—Old-Type Journal Bearing Construction Used on German Freight Cars

of these lower parts. Much oil was lost, dust and sand entered, and the train crews were kept busy tightening the bolts, which usually turned very hard.

Passenger coaches then used a bearing shown in Fig. 2, which was copied from American practice. It gave excellent service, was made of one piece, and was readily replaceable. This journal bearing can no longer be kept on German roads, due to the present method of yard shifting. The bearing surrounds only about one-third of the upper part of the axle, so that every time the car wheels are blocked suddenly considerable shock is exerted upon the bearing. A further dis-

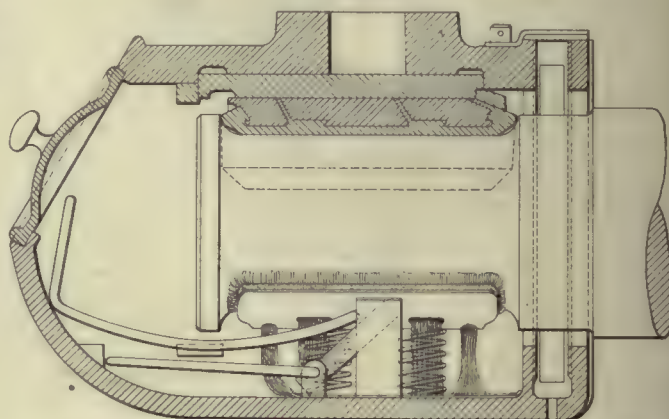


Fig. 2—Old-Type Journal Bearing Construction Used Under German Passenger Cars

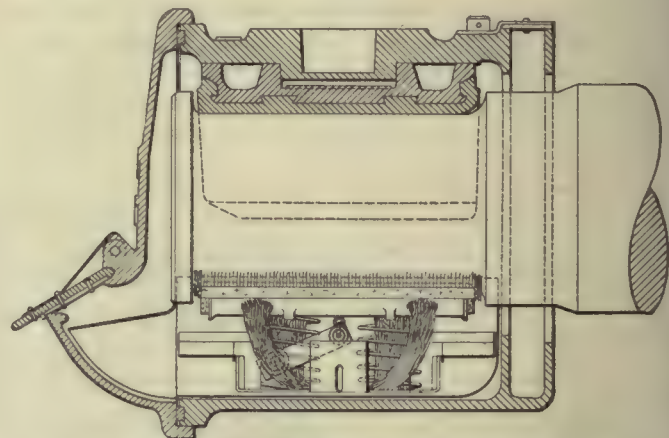


Fig. 3—New-Type Journal Bearing Construction Used Under Freight Cars

tion has been adopted. This is shown in Fig. 3 and is now in very wide use, there being approximately 25,000 freight cars on German roads with this journal bearing construction. In spite of great opposition, the journal bearing was made out of cast-steel rather than cast-iron. During the years 1914 and 1916, it developed that under certain circumstances the internal parts of this bearing could be twisted around, so that in many cases the bearing was found underneath. This was no doubt partly due to the yard service becoming more and more severe. These observations have led to a redesign of the bearing, with its edges reinforced, and the bearing lengthened at both ends, so that it now reaches well beyond the horizontal center line of

*Abstracted from an article in *Verkehrstechnik*, June 25, 1926.

the axle. During the copper and tin scarcity of 1916, the bearings had to be made temporarily of iron. This new bearing, called C2, was a considerable improvement over any previous bearing, and it proved to be quite unaffected by even the heaviest jolts. The journal box and bearing consists of but few parts, and all of these parts are interchangeable. Contrary to the original construction, shown in Fig. 1, a lining is provided, which can be replaced readily when its bearing metal is worn out. The former disadvantage of this type of bearing, that when made solid it does not permit ready inspection, did not hold, because it was such a great

1. Possibility of introducing a lubricating system which would give three-year service with one lubrication of the journal.

2. Methods necessary to avoid deformation and displacement of the bearing.

3. Improvements desirable for all details of the bearing.

It was found that a mechanical lubrication method has so far not given fully satisfactory service. Experience with lubrication from the bottom only does not seem to lead to the desired goal. It may be that top and bottom lubrication will have to be taken up

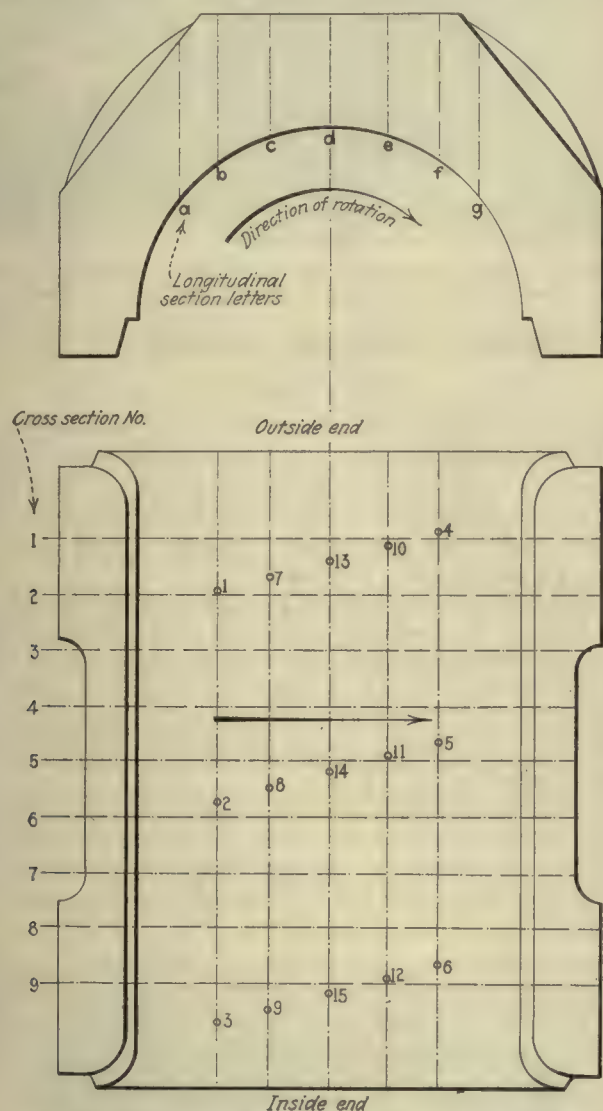


Fig. 4—Construction of Bearing Used for Test Purposes

improvement over the old bearing that such inspection was not necessary, or at least it was necessary only after long periods. Practical experience showed that hot-boxes occurred very rarely.

With increased weight of equipment faults began to develop even with this bearing, particularly on the heavy 20-ton cars. As already mentioned, iron bearings had to be introduced during the war, and these caused considerable trouble. When the bearing metal melted out, the axle ran on the iron and caused rapid wear of the journal. In some cases the damage was so severe that the end of the axle broke off. These troubles led to extensive research in order to determine what the weak points of this bearing were, and how they could be best overcome. In particular, the following points were investigated:

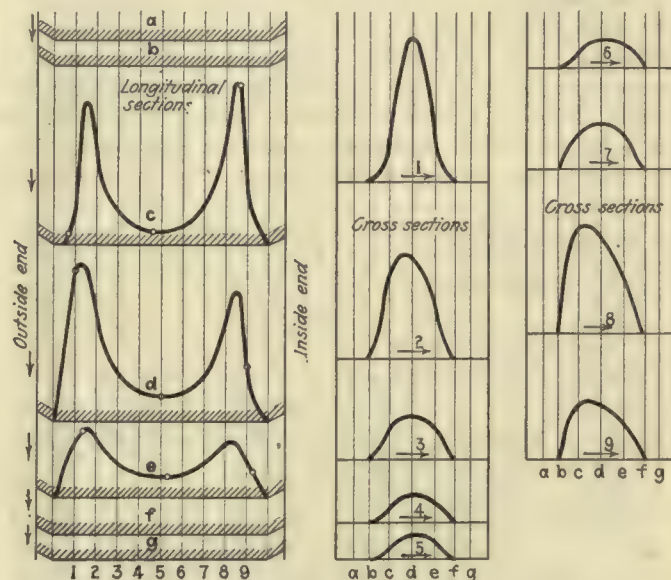


Fig. 5—Graphical Representation of Test Results for Bearing Shown in Fig. 4

again, and it is not improbable that in the near future a new, totally different, bearing may have to be devised.

An oiltight construction of the journal box has been sought by many investigators since 1919, and no fully satisfactory method has as yet been found. It is desir-

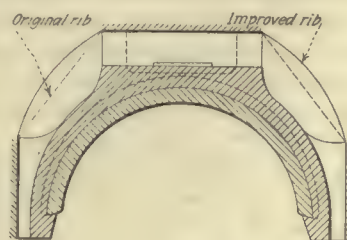


Fig. 6—Improved Bearing With Rib Reinforcements

able that under no conditions shall even the slightest amount of oil be permitted to leak out of the bearing. It is probable that a material will have to be found which can give emergency lubrication for the journal where the bearing is neglected to such an extent that it becomes dry.

Very extensive investigations have been made, recently in the railroad shops in Göttingen, to determine the exact nature and cause of hot-boxes. A special test arrangement was set up, and a bearing lining of alloy such as is being used now by the railroads was provided with fifteen small holes, distributed on its bearing surface as shown in Fig. 4, and each of those little holes was connected by a small copper tube to a pressure indicator. The bearing under test was lubricated from underneath, just as in actual service, and a

mechanical oil conveyor supplied 186 gm. of oil per minute. For comparison with this bearing, a standard pad-lubricated bearing, consuming 0.25 gm. per minute, was tested. Some of the results found were rather surprising. For example, the maximum pressure of the bearing is not in its middle, but is at its two ends, and the maximum pressure was also found to be displaced 5 deg., depending on the direction of rotation.

Fig 5 shows graphically the data obtained. During these tests, the bearing was loaded with 7,000 kg. (15,400 lb.), and the wheel was rotated at a speed corresponding to 45 km. per hour (28 m.p.h.). The pressure resulting was 40 kg. per square centimeter (700 lb. per square inch) assuming the width of the surface as 9 cm. (3.546 in.). The shape of the oil pressure curve is due to the fact that the bearing apparently rests on the axle only at its two ends, while its middle is bent out. The results also indicate that the bearing is wrong theoretically. The location of the maximum

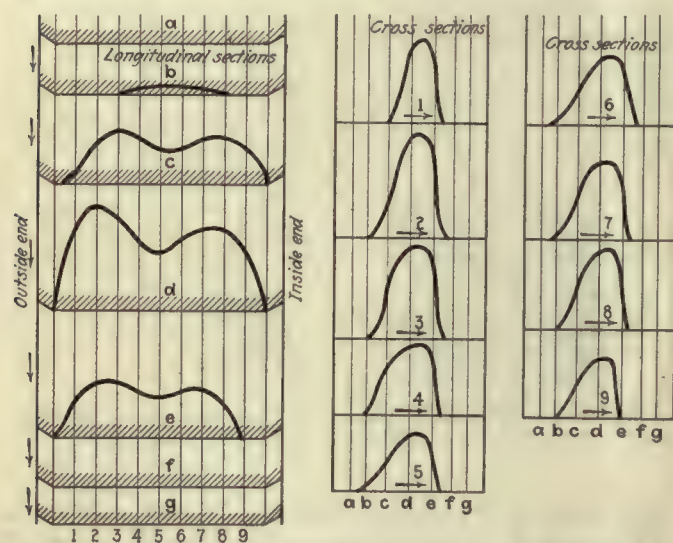


Fig. 7—Test Results with Improved Type of Bearing

pressure explains why the bearings run hot frequently, as the heating always begins at the two ends.

The construction of the present bearing will not permit changes necessary to improve the bearing surface. Other ways, therefore, will have to be followed. The strength of the alloy decreases with the temperature and this may result in serious damage. Deformation of the bearing occurs also in its cold condition. For this reason weak parts were improved by providing heavier ribs, as shown in Fig. 6.

All these conditions seem to indicate that a new bearing metal should be found which will give a certain amount of lubrication even when red hot. This resulted in trial of a cast-steel bearing with inner alloy shell. Tests with this new construction were made in a way similar to the previous tests and results are shown in Fig. 7. The results are not yet ideal, but the flat character of the curves show a considerable improvement.

Artificially introduced hot-boxes gave the following results: With a load of 7 tons on the wheel, the bearing became red hot 45 minutes after its lubrication was stopped. In this red-hot condition the bearing ran satisfactorily for three-quarters of an hour longer, after which time the axle became cherry red. From this moment on no further change took place, because apparently the heat generated was equalized by the radiated heat. After the test the bearing metal was found to be worn off 2 mm. (0.08 in.).



New Baggage Carrier Opened to Allow the Placing of Hand Luggage in the Compartment, Under the Rear Seat

Improved Baggage Carriers on New P.-O. Coaches

BUILT-IN baggage carriers are a new feature on the Pennsylvania-Ohio coaches recently purchased. Previously a carrier known as the "bustle type" was hung on the rear end. In these latest de luxe coaches the space under the rear seat has been made available through doors in the rear end.

An accompanying view shows an operator in the act of storing a customer's bag in this compartment. Another view shows the doors closed, ready to go. One of the views is taken in front of a typical suburban coach station, showing the illuminated sign, built in the form of a shield, typical of all P-O rail and coach operations.

Particular attention has been given in the design to provide an attractive rear end. A recessed aluminum frame is provided for the tail light, and state license plate and rear end stop lights have flush aluminum fittings.



Doors in New Style Baggage Car Closed, and Ready to Move. Note the Recessed Aluminum Frame for the Tail Light and State License Plate

The Readers' Forum

Operation of the Straight Air-Brake

LOS ANGELES, CAL., June 23, 1926.

To the Editor:

Nowadays there are really only two different general methods taught motormen in manipulating brake valves: (1) the once to service position with three subsequent releases; and (2) the split application and release method.

In the first method, the motorman is required to get sufficient air to make a stop the first time the handle is placed in service position. A second movement to service position is discouraged. This is very good in theory, but in practice there are numerous disadvantages, so many, in fact, that only one street railway on the Pacific Coast teaches it. Advantages of this system are that the air is applied the hardest when speed is at maximum. A stop is made in the shortest possible distance, with, it is claimed, a corresponding reduction in brakeshoe wear. The disadvantages are that it is too hard on standing passengers, particularly when the car is equipped with large service port brake valves; and is dangerous on slippery rails. The motormen soon get into a rut. It requires more skill than the average motorman possesses and causes too many flat wheels, because many motormen form the habit of admitting too much air so as to avoid a second movement to service position.

About the only way this system can be operated without discomfort to passengers is to make a mild application and drag up to the stop. This, of course, is impractical in most cities, where the schedules require a motorman to use from 30 to 45 lb. of air to make a stop from speed. There are too many variations of equipment, rail conditions and gradient to tie a motorman down to any absolute method. If this is done the accident and flat wheel record is sure to suffer.

In the second system, the motorman is instructed to move the brake valve handle to service twice from lap, splitting the application, so to speak. This avoids causing the brakeshoes to come up against the wheels with a nasty snap, which is objectionable to standing passengers. Using this system, about 25 or 30 lb. of air can be admitted the first time and then 10 or 15 lb. in the next movement. It is extremely important, however, to impress on motormen that the second movement to service should be made within about five seconds of the first one. If this is not done motormen soon form a habit of letting in a little air at a time, with the result that there is a high cylinder pressure when brakeshoes are taking hold the hardest, and this results in sliding wheels.

The simplest way to teach this system is to instruct the motorman to apply sufficient air to make a stop before the front end of the car has passed the prospective stop, and make graduations near the end of the stop. The first graduation must be made before the sliding point has been reached. Too many motormen believe that graduated releases will start the wheels after they are once locked. This is wrong. An almost complete release is necessary, depending on the condition of the rail. The graduated releases in the

second system are the same as for the first system, with the exception that no fixed number is recommended.

Advantages of this second method are that it is easier on standing passengers; does not kill momentum so quickly that an early release is necessary; safer on slipping rails; easier to spot car; easier to teach to new motormen. It is not an absolute system, therefore it meets the thousand and one variations of speed, equipment, grade and brake equipment. It is widely used by street railways in the United States. It has been used in Seattle, Tacoma, Oakland, San Francisco and Los Angeles with good success. The Los Angeles Railway believes in it implicitly, and its smoothness of operation is hard to beat. This railway has in effect a rigid follow-up system for new men, and any improper operation of brake valve is checked. "As the twig is bent, the tree will incline"; it never fails.

Disadvantages of this method are that it will cause as many, if not more, flat wheels than the first system, unless motormen are taught to apply air the hardest when speed is near its maximum. Some motormen will make second movement to service after speed has been greatly reduced, which will lock a pair of wheels. There is a tendency in some motormen to fan the handle. These three disadvantages can be easily overcome by proper instruction and a follow-up system.

There are many variations in brake valves and equipment. Electric railways teaching motormen the first system will find it works the best with old-type brake valves and outside-hung brake rigging. The old-type Christensen, Westinghouse and National brake valves work the best. The fast schedules of today, however, have developed brake valves such as National P.V., Westinghouse S.M.E. and M.-18a and General Electric that will admit about 30 lb. of air a second in service position. These are generally used with inside hung brake rigging, which makes a pretty severe brake. This system is at its worst with that equipment.

The following few points should never be overlooked in teaching new motormen: Proper braking is 50 per cent good judgment and the rest proper instruction. When applying air, always be governed by the speed condition of the rail and comfort of passengers; use as little air as possible. Apply air hardest when speed is at maximum. The holding power of brakeshoes is greater at low speed than high. Coast up to all stops as much as possible. Never fan the brake handle. Don't imagine you can operate the brake valve exactly the same for every stop. Never use sand for service stops in street railway service. Running on lap with power on is a sign of ignorance. Don't forget the wheels; if they are flat it is a sign of some one's inefficiency, usually the motorman's. An application is from the time the brake is first applied until the first release. There are few excuses for second applications. The only time they should be used is when approaching dangerous places.

GEORGE W. BOOTH,

Motormen Los Angeles Railway; formerly Motorman the Connecticut Company and Interurban Motorman, Portland Electric Power Company.

To simplify the work of instructing new employees in the transportation service, R. B. Hill, superintendent of operation Los Angeles Railway, has prepared a book of information to students. This begins with a statement on courtesy and continues with information about equipment, uniforms, safety and accidents.

Maintenance Notes

Flexible Track With Steel Ties

BY NELSON R. LOVE
Chief Engineer Denver Tramway
Corporation, Denver, Col.

IN A paper presented before the annual meeting of the Midwest Electric Railway Association, Denver, Col., June 8, 9 and 10, 1926, a special cushion track construction was described. This design, which is illustrated herewith, uses concrete and asphalt together with the steel ties exclusively. It will be seen that

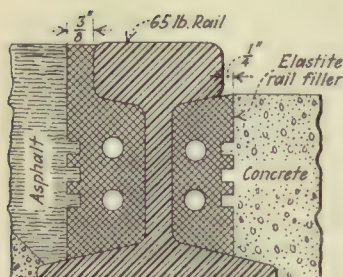
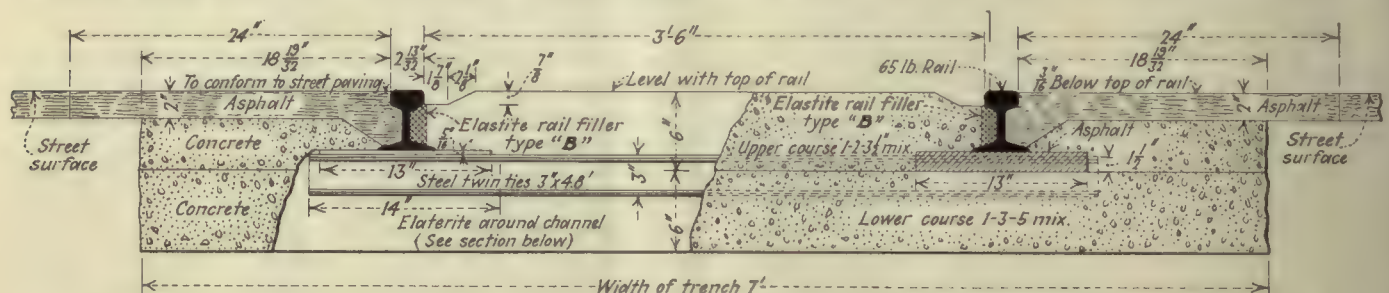
side the rail and this is laid directly against the rail.

One of the lower sections in the accompanying illustration shows a type A elastite rail filler installed between the rail and the asphalt. A stretch of track has been tried with this construction and further experiments in regard to this flexible construction will soon be tried.

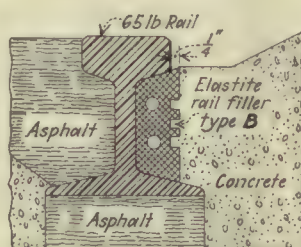
Canting of the rail to a slope of one to twenty-five is a feature of this construction, the steel ties being bent so as to provide for this. Inspection of the track after a year's service

Metal Used Almost Exclusively for Car Sheathing

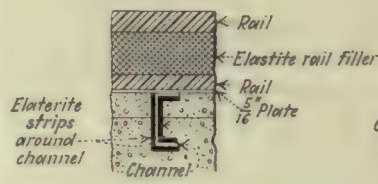
IN MAKING extensive renovations on a number of cars in the Holyoke Street Railway shops recently it was decided to use all metal sheathing in renewing the sides of the cars. The pieces are welded together, making a continuous strip of sixteen-gage metal sheathing. It was found to be simpler to adopt this practice even on the older wooden type cars, since the fitting and welding of the metal may be accomplished with consider-



Section Through Rail
Showing Elastite Rail Filler Type A
Installed Near Clarkson



Section Through Rail
Between Ties



Section "A"
Showing Elastite
Around Channel

Concrete prop.
Upper course 1-2-3 1/2 mix
crushed rock aggregate
Lower course 1-3-5 mix
gravel aggregate

Flexible Track With Asphalt and Concrete Paving

the steel ties function only in a horizontal direction in order to maintain gage and proper tilting of the rail. Vertical loads are sustained entirely by the ordinary paving asphalt, which is tamped solidly underneath the rail and ties by means of electric tampers. This track was installed on Colfax Avenue, Denver, a year ago and has proved an ideal type of flexible track.

In the illustration showing a section through the track it will be seen that the concrete paving does not come in contact with the rails at any point, although concrete is used to pave between the rails. A special type B elastite rail filler is placed between the rail and the asphalt paving. Asphalt paving is used out-

shows that the rail has worn very smoothly and there is no sign of corrugation. The cost of this type of construction is approximately the same as for the standard type of track previously used, which employs wood ties on a 9-in. concrete ballast and paving. The surface appearance of this special track is more pleasing, primarily because the rails themselves constitute the only joint in the paving. The asphalt is continuous from the track to the curb and the concrete is continuous inside the track.

No expansion joints were placed in the concrete, which runs in a continuous stretch of approximately 1,200 ft. Inspection shows only a few hair cracks.

ably less effort than it required for constructing a wood sheathing.

On the dashers of the cars three metal strips are used, since the front and rear-end collisions which are such frequent occurrences may at times only result in one section of the dash being damaged. With the sectional metal strips it is possible to replace one or two sections without renewing the entire dasher.

Metal battens are used instead of wood, for it has been the experience of the company that trucks and other vehicles scraping the sides of the street cars will invariably tear off a wooden batten. The metal battens seem to fare considerably better under similar treatment than those of the wooden type.

Dick Prescott's Promotion Is Discussed

And Trouble Brews



ON THE same evening that Dick Prescott spent at home contemplating the opportunities before him in his new position of assistant to Tom Mullaney, superintendent of equipment, his promotion was the subject of a discussion far less pleasant in character.

At one of the battered green-topped tables in a backroom rendezvous for the idlers of the neighborhood, not far from the Consolidated Railway & Light Company's shop, Pete Welcher, shop inspector, swapped grievances with three of his cronies. "Slowfoot" Lewis, "Lefty" Kooms and "Shorty" Green knew well the import of Inspector Pete's announcement that Dick Prescott had been made Mullaney's assistant. It was obvious that the new appointment was a setback for the inspector's personal ambition, and at the same time promised seriously to disturb the arrangement whereby Pete traded a willingness to overlook obvious defections from maintenance rules for active support by a small clique among the men.

Under the stimulus of his sympathetic audience, Pete dropped his customary caution and gave, way freely to his bitterness.

"This new manager downtown sure must have Mullaney buffaloed all right," he told them in a confidential tone by way of indicating the reason for his own failure to win the promotion. "Think of making a guy like this bird Prescott assistant superintendent!"

"What does he know about a railroad anyhow?" questioned Slowfoot, who knew more about the tricks for avoiding an honest day's work than any man in the shop, and who never lost an opportunity of cultivating inspector Pete's favor.

"Nothin'!" declared that offended individual with a sneer.

"What do they want to go messin' things all up for?" piped "Lefty" Kooms. "We was all goin' along all right and nobody had to work too damn hard at that. Who started all this fuss anyhow?"

"Well, I got a notion this guy Prescott's been nosin' around ever since he's been here, and has spilled a lot of stuff in the office. It's up to us boys to show him up quick or this shop won't be no place to work at all."

"What's his game, do you suppose?" asked "Shorty" Green, also catering to the wisdom of Pete:

"Oh, he's got a lot of schemes to make every guy in the shop think they're salesmen, or some such bunk.

You can bet your bottom dollar if somebody don't stop him, some of you guys will find things awful unhealthy 'fore he's done."

"They ought to 'a made you assistant superintendent," ventured "Slowfoot," quick to grasp the opportunity to get in a good word for Pete. "This would be a real joint to work in then."

"Keep your trap shut and use your head," snapped Pete by way of cover-

ing up his pleasure at thus having his own case stated so frankly.

"What are we goin' to do?" again questioned "Shorty" Green.

"You guys keep your eyes and ears open, and we'll soon put the skids under him. All we got to do is get him out on a good trouble job some one of these days and he'll fall down so hard we won't need to worry about him much."

In the past few weeks, Dick Prescott had sensed something of an undertone in the shop that was not in accord with the new spirit of the management. On the whole, most of the men and foremen began to feel the satisfaction which comes from membership in a hard fighting team. The old shop began to take on a new importance in winning back public favor for the railway. Each man's job was becoming more a part in the game and less of a mere task for a day's wage. But little did Dick suspect how soon he was to learn that in any such group of men there are always a few who are more interested in dodging work than in getting satisfaction from a job well done; that there are some always jealous of progress in others, and quick to put obstacles in the way of accomplishment.

A Letter to Dick Prescott

EDITOR'S NOTE—Many unusual letters come to the desk of an editor. Some carry blame, some praise and some a challenge. Ordinarily an editor pays no attention to an anonymous communication. He may or may not read through such a message, but that is usually the end of it. This is an exception to the rule. Dick Prescott is a fictitious person. So there seemed to be justification for publishing the anonymous letter signed "An Ardent Admirer," not because "An Ardent Admirer" sounded sweet, but because we were the provocateur in creating the fictitious Dick and because the letter tickled our risibilities, as it probably will yours. The ethics of journalism require that the editor keep confidential the names of his correspondents where they so request it. Our correspondent apparently did not know this. With this assurance from us we hope that "An Ardent Admirer" will disclose his identity so we may be permitted personally to congratulate him. We certainly pardon "An Ardent Admirer" for addressing us as Dear Dick. We admonish him, however, to come out into the open if he expects again to make the editorial grade.

July 25, 1926.

Dear Dick:

Please pardon my familiarity in addressing you by your first name but I am inspired so to do through the pleasure given me by your promotion as noted in the *ELECTRIC RAILWAY JOURNAL* for July 17. I tender you my congratulations and would ask you to congratulate for me your little playmate, Tom Mullaney, who was given a promotion at the same time.

"Merit tells" and "You can't keep a good man down" and all that rot, you know.

However, this letter is meant to be optimistic, cheerful and constructive, so I'll lay off of any of the chronic pessimisms and blind adherence to obsolete methods so dear to the heart of the electric railway employee. We are living in a modern age, and all around us are evidences of changing methods and a

realization that the seller must give the buyer what the latter wants, especially when he is ready and willing to pay for it. The fact that your superior officer, Mr. Milburn, your playmate Tom, and you seem to be imbued with a progressive spirit leads me to believe that you three have acquired or will acquire that realization and thereby become a Faith, Hope and Charity combination alone by yourselves.

But don't be downhearted—some of the rest of us are with you in spirit but we don't dare say so out loud.

The fact that you "visualize the opportunities that lay ahead because of the very difficulties in the present railway situation" and "street cars can be made more attractive through improvement in design and better maintenance" is very comforting, and "everything's going to be all right" if you are not about ten years too late. Of course you can't be blamed if your predecessors and their colleagues, while riding in automobiles equipped with comfortable seats, were so dumb as to figure that slat or cane seats in a rattling trolley car were good enough for everybody else. Neither can you be blamed for their attitude that people must ride in trolley cars because the railway owners had been good boys and faithful to their trust in pioneering the transportation facilities (whether *now* good, bad or indifferent)—such cry-baby attitude being directly responsible for driving away business. It is not your fault that the railway operators who are using buses look upon them with the same admiring complacency that guests at a lawn party would at the advent of a skunk. This is not said in derogation of a skunk because that animal really has some good qualities—on the surface at least. I admire your "new ambition and enthusiasm."

AN ARDENT ADMIRER.

Stringing Trolley Wire by Improved Methods in Cleveland

BY JAMES SCOTT

Superintendent of Overhead Lines, Cleveland Railway, Cleveland, Ohio

RAPID removal and restringing of trolley wire has been made possible through the use of a new trolley wire stringing truck which has just been placed in service by the Cleveland Railway, Cleveland, Ohio. The use of this truck permits many radical changes in wire-stringing methods. The super-structure and equipment for the reel truck were

by simply screwing down upon a wing nut that is placed in the center of the crossbar. Thus any tension desired for the trolley wire may be secured readily. When starting to string wire this nut may be set and the reel will not require any further attention. The equipment of both reels is the same and these are designed so as to allow handles to fit

before the wheel guards were installed on it.

With this equipment old trolley wire can be taken down and new wire installed at the same time without any interruption of traffic. This double operation requires two tower trucks and the reel truck. The first tower truck removes the trolley wire from the span and it is then led through the opening above the cab and wound up on the reel. Before stringing, the desired tension on the reel of new wire is set, and the new wire is led over the top of the rear tower truck and tied in upon the span wires.



By Use of the New Reel Truck Together With two Tower Trucks, Trolley Wire Can Be Taken Down and New Wire Installed at the Same Time without Interrupting Traffic

built by the mechanical department of the Cleveland Railway. They are mounted on a 45-hp. White chassis. This truck is provided with two carriages for holding trolley wire reels. These are mounted by means of a specially designed shaft which will fit practically any make of reel. Drums of pressed paper are mounted on each end of this shaft, and a brake band lined with standard automobile brake lining is fitted around these drums. Two rods joined to a common crossbar are attached to the brake bands.

In the accompanying illustration showing the reel truck, the braking arrangement can be seen at the bottom of the reel. With this braking apparatus an equal pressure is applied to both sides of the reel shaft

the reel shaft, the handles being used to rotate the drums for reeling in of worn trolley wire.

Inside on the top of the truck a chain fall and runways are installed that permit the loading and unloading of reels by one man. An opening in the body framework above the driver's cab allows the trolley wire to be reeled in. This opening is equipped with a roller.

At the present time four laborers are used in the operation of reeling in old trolley wire, but further improvements are planned which will make the operation entirely mechanical and so eliminate the laborers. The platform running the length of the truck folds up when the truck is not in actual use. The picture of the truck reproduced herewith was taken

While in the tracks in the operation of stringing, the trucks are spaced about 70 ft. apart to allow the men to tie the wire in. When a street car approaches they pull to one side and close up. The car then coasts by. The trucks can then turn back into the track and proceed. A third tower truck comes along behind the others and attaches the ears and aligns the wire. By this method a mile of trolley wire may be strung, taken down, and practically all insulated for service in 2½ hours.

The tension obtained by means of the reel-braking apparatus is such that it is necessary only to pull the trolley about every 1,500 ft. Due to the fine performance of both reel brake and truck there is practically no vibration at all in the line.



New Trolley Wire Stringing Truck Just Placed in Service by the Cleveland Railway

By use of this equipment, in an emergency two tracks may be strung at the same time if desired. The truck is also equipped with ladders, located alongside the driver's cab. These lead to the truck roof, which is designed to permit linemen to work from it. This method of wire stringing has resulted in great economy and a large saving in labor. One foreman can control all the trucks used and it is not necessary to disturb overhead equipment.

Shop Made Anti-Climber Bumper

A COMBINATION draw pocket and anti-climber bumper has been developed and made by the West Penn Railways. The view shown is one of these units just installed on a Wheeling Traction car that is being overhauled in the Wheeling shop.

Constructed from a section of standard 9-in. channel, the piece is first bent to conform to the car end. Then the corners of the flange are burned off by the acetylene torch and forged to shape. The center section is cut from a steel plate of the same thickness as the channel flanges and curved to fit the inner flat face. This center section is then electric welded in place, making a three leg anti-climber.

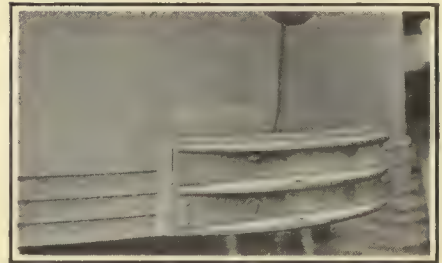
On top of each angle flange an

additional crescent-shaped piece of steel plate is cut and welded to form the continuous face shown, thus increasing the depth of the channel flanges in the center of the bumper.

This extra flange depth serves two purposes: First, it provides a more

certain lock to prevent telescoping in case of a severe end on collision and, second, it allows the drilling of an adequate draw pin hole and the use of a draw bar in case of pull-ins.

The entire device is mounted on



Combination Anti-Climber Bumper and Draw Pocket Installed at Center of Standard Anti-Climber

an oak plank and bolted firmly to the steel floor and platform members, so that stresses due to collision are transferred to the steel work forming the floor members. As noted in the view this bumper is inserted in a standard anti-chamber, the center of which was first cut out.

One Man Handles Heavy Casting with Hand Truck

FOR transporting heavy parts about the shops, the Department of Street Railways, Detroit, Mich., makes use of standard platforms under which Cowan trucks are placed



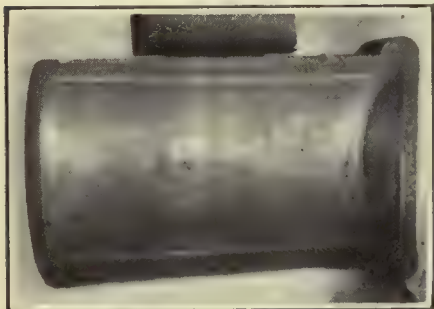
Hand Trucks with Separate Platforms Are Used for Moving Heavy Parts About the Shops of the Department of Street Railways, Detroit, Mich.

to move these about the shop. These platforms have a top of planking 10 in. above the floor and strap iron supports at either side so as to provide a light construction. One man can run a hand truck underneath such a platform and, by ratcheting the handle, raise the platform free from the floor, so that it rests only on the truck and so can be moved about readily.

Journal Bearing Designed to Take Axle Thrust

END thrust is taken on the axle bearings instead of on thrust collars in cars of the Wheeling Traction Company, Wheeling, W. Va. This design originated on the West Penn Railways, the parent company.

The bearing is cast with an end and has a bearing on nearly half of the axle as shown in the accompanying view. The bearing itself is locked in place by its projecting



Bronze Journal Bearing Used in Wheeling

This bearing is cast with an end surface on which the axle thrust is taken instead of on thrust collars. When new a bronze-to-steel bearing is used, but when this surface becomes worn so that too much play exists a babbitt surface is applied.

above the journal housing. When new bearings are placed in cars the end thrust bearing is also replaced. This is much simpler than to place a new axle collar on the axle inside the truck frame. Furthermore, the thrust surface is always lubricated in this arrangement.

When the thrust surface becomes worn the end is given a babbitt surface at the same time as the bearing is rebabbitted. When new, no babbitt is used on the thrust surface. A special babbitting form is used that allows the thrust surface to be cast coincident with the curved surface.

Blacksmith's Shop Kept Clean

ONE of the cleanest parts of the Chattanooga shop of the Tennessee Electric Power Company is the blacksmith shop. No cinders



One of the Cleanest Blacksmith's Shops Can Be Seen on the Chattanooga Railway Division of the Tennessee Electric Power Company

are allowed to accumulate around the forge and only the day's scale can be seen around the anvil. Stock is seen against the rear walls. There

is a place for all tools and at night they are put away so that the floor of the shop can be swept clean easily.

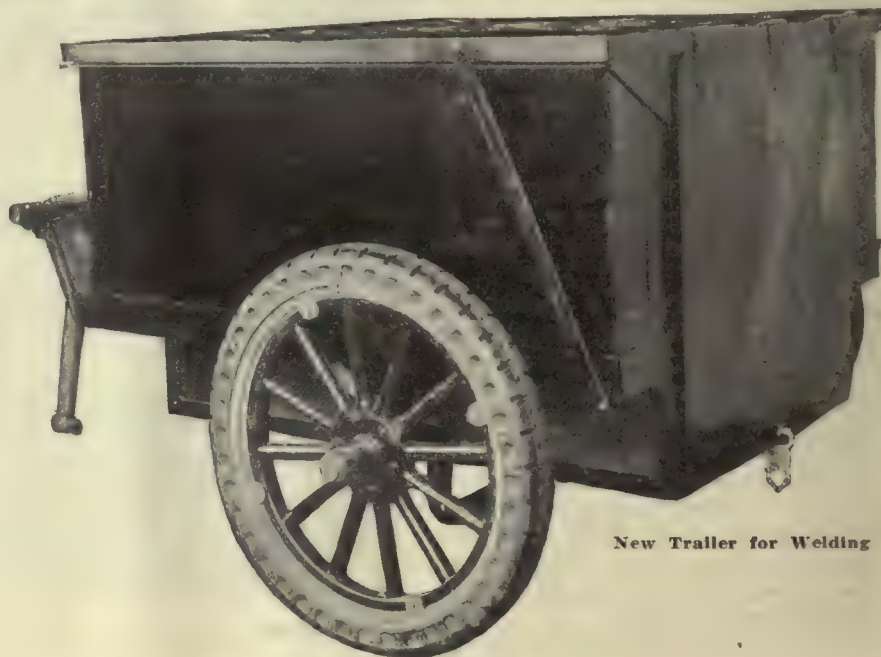
New Equipment Available

Cushion Tired Trailer for Welding Equipment

FOR transporting resistance type track welding equipment on city streets, the Electric Railway Improvement Company, Cleveland, Ohio, has recently developed a bonding and track-welding equipment mounted on a cushion-tired trailer. This is strong but light and has a sturdy metal frame. Two generous tool boxes are provided for carrying equipment, and space for placing the welding rheostat is also arranged.

One cover is equipped with a folding rear panel which covers both the rheostat space and the tool boxes. A single lock at the rear protects the trailer from entry by unauthorized persons.

By raising the cover the welding rheostat can be operated in the usual manner. Ample ventilation is provided for the removal of heat. This equipment has been given type No. SRT-2. It weighs approximately 500 lb. complete, and particular care has been given to balancing the weight so that it can be handled by one man.



New Trailer for Welding

Association News & Discussions

Publicity and Equipment Problems Discussed at La Crosse

At a Meeting of the Electric Railway Section of Wisconsin
Utilities Association Specific Subjects Valuable to
the Operator Were Considered

LA CROSSE, WIS., was the scene of the annual convention of the Electric Railway Section of the Wisconsin Utilities Association, held on Aug. 12-13 under the leadership of Chairman Nels C. Rasmussen of the Wisconsin Valley Electric Company, Wausau. Specific subjects that have a direct bearing on departmental work received major consideration. C. R. Phenicie delivered an excellent paper, abstracted elsewhere, on opportunities of a transportation man for establishing good public relations. In his paper, and particularly in the discussion by B. W. Arnold, a note of caution was sounded against being too obvious in attempts to please the public. Care should be used to avoid having the public feel like animals in the Zoo where they must know they are being "worked on." Mr. Phenicie further said that public relations might be defined as human nature diplomacy applied to human nature.

H. M. Pauley, local manager Wisconsin Gas & Electric Company, Kenosha, said that improvements should often be made without undue publicity, allowing the public to realize the good work of the company through observing the facts, rather than observing the publicity of those facts.

C. M. Larson, chief engineer Wisconsin Railroad Commission, offered his opinion that many utilities have failed to convince the public that they are straight shooters and it is necessary for them to establish this condition before they can expect the best results from the public.

J. P. Pulliam, vice-president and general manager Mississippi Valley Public Service Company, spoke of the value of having the employees know the business of the company and be familiar enough with the policies so that they may tell the company's story among their friends and to the public that come in contact with these employees. Mr. Pulliam believes that the city railway business is improving but has serious doubts as to many interurban roads in Wisconsin.

NOISE MEASURED GRAPHICALLY

Perhaps, the paper of greatest interest, because of its distinctly new material, was that of Kent Wooldridge who is now with the Chicago Rapid Transit Company of Chicago. Mr. Wooldridge, electric railway fellow of the Wisconsin Utilities Association at the University of Wisconsin, spent the year developing an apparatus that

would measure and analyze the noise made in street car operation. In his report he outlined briefly the principles used and gave enough of the results obtained on several properties in the state to indicate there were great possibilities in the use of this type of test equipment. The principle of the apparatus was an inversion of the usual radio receiving set. The sounds were picked up by the use of a loud speaker, which acted as a transmitter and produced a varying electric current, which caused a movement of the needle of a microammeter in unison with the sounds. Use of this equipment has indicated possibilities of segregating the different types of noises. While this first year has been devoted largely to the development of the equipment, it is to be hoped that the apparatus will be perfected and that considerable data will be obtained for different types of car and track construction.

Mr. Wooldridge gave it as his opinion, based on the studies he made this year that on straight track 30 per cent of the noise originates from the roadbed; 20 per cent from the wheels; 15 per cent from gears and pinions; 20 per

cent from the truck brake rigging; 10 per cent from the car body; and 5 per cent from the trolley. A more complete description of this equipment and the early results obtained which are indicative of the possibilities of this kind of a study will appear in a subsequent issue of this paper.

Chairman Nels Rasmussen is an optimist. One could see this from his annual address. However, he believes that increased speed and better facilities are required to produce riders under modern conditions. The automobile has taught the public luxury of travel and the railways must offer comparable facilities. Mr. Rasmussen believes in the future of common carrier service operated under proper conditions.

B. W. Arnold, manager motor coach department, Chicago, North Shore & Milwaukee Railway Company, read a paper on accident prevention from an executive viewpoint, which is published elsewhere in this issue.

R. M. Howard, vice-president Mississippi Valley Service Company, Winona, Minn., for years has kept accident figures for the electric railways in Wisconsin. From the table of accidents reproduced herewith, automobile collisions have decreased from the high of 1923, while the increase in automobiles registered in the state in each year since, has been 69,500 per year. Mr. Howard saw in these figures an improvement in the accident situation and stated that the transportation companies have been successful in improving equipment and operating methods that would successfully meet the situation. A large share of these collisions occur on business streets served by car lines. Suitable parking restrictions would not only reduce accidents, but greatly relieve the congestion on the streets. Association members, he felt, should use their influence to improve their local situation and recommended that recent traffic surveys be used to indicate to merchants that the elimination of parking on business streets would not injure, but rather improve their business.

F. R. Coates, president American Electric Railway Association, prepared a paper but due to his inability to be present in person, it was read by Captain Leslie Vickers, economist of the association.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

November 16-19—American Welding Society, fall meeting and International Welding and Cutting Exposition, Buffalo, New York.

ACCIDENTS AND COLLISIONS IN THE STATE OF WISCONSIN

Year	Car-Miles Operated	Total Transportation Accidents	Auto- mobile Collisions
1918	34,028,371	9,438	3,497
1919	30,870,393	9,636	3,997
1920	33,694,023	12,247	5,662
1921	32,831,916	11,257	5,522
1922	34,469,690	11,279	5,780
1923	35,011,123	13,818	7,422
1924	37,917,230	13,502	6,811
1925	37,651,771	13,958	6,775

WISCONSIN AUTOMOBILE AND TRUCK
LICENSES ISSUED DURING THE YEARS
1918-1925, INCLUSIVE, HAVE
INCREASED RAPIDLY

Year	Registration	Increase
1918	196,844	.....
1919	236,881	40,137
1920	293,298	56,317
1921	341,741	48,443
1922	387,848	46,107
1923	457,271	69,423
1924	526,814	69,543
1925	596,386	69,572

Mr. Coates likened the electric railway industry to the farms of Wisconsin when Abraham Lincoln once advised the farmers to "plow deeper" for greater crops. Mr. Coates does not believe that the surface has been scratched as far as common carrier transportation is concerned. His paper is abstracted elsewhere.

Door control and the circulating load method of car operation were discussed by P. W. Gerhardt, assistant superintendent of transportation The Milwaukee Electric Railway & Light Company, and Oscar A. Broten, western manager National Pneumatic Company. These papers are abstracted elsewhere. Both are firm in their belief that this method makes possible one man operation of relatively large cars in heavy service.

In discussion of these two papers, Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad, considered that the automatic door devices operated by a pneumatic engine are eminently successful. R. M. Howard believes that this plan of operation with one man, using the treadle device on the rear door, operates under crowded conditions and adheres to schedules better than two-man cars.

Use of the foot valve aroused considerable discussion, some claiming that good operators do not use it to any extent and others claiming that the safety devices would be impossible unless some provision were made so that a man could remove his hand from the controller handle on long runs.

Earl F. Harra, master mechanic Wisconsin Power & Light Company, Oshkosh, said that he makes a practice of blowing out all air pipes in the fall with high-pressure air. He washes the air engines at the same time and re-oils the moving parts with a high grade thin oil to avoid sticking in the winter. He claims that blowing out small particles of dust and scale each year prevents the freezing of air pipes due to condenser moisture in the compressed air.

Mr. Broten in discussion said that practically all of the trouble due to freezing could be eliminated by avoiding the use of pipe that was too small. If necessary to use small pipe, it should be run on the floor inside of the car.

C. M. Larson, chief engineer Wisconsin Railroad Commission, spoke for Commissioner Andrew R. McDonald. He said that the Wisconsin Railroad Commission was unanimously in favor of repealing the law requiring electric railways to flag railroad crossings, now requiring either a watchman or two men on each car. This law was originally passed in Wisconsin through the urgency of the Milwaukee city council

and which was determined to defeat one-man operation in that city. As shown in Mr. Gerhardt's paper, these difficulties have been largely overcome and the commission is convinced that there is no more reason to flag electric cars over railroad crossings than buses.

At the present time, the commission has little jurisdiction over buses in the state. An applicant must file schedules and rates of fare but the commission has no jurisdiction over the application except to see that adequate insurance is carried. Mr. Larson believed that this law should be amended to allow the commission the right to determine the necessity for bus service applications before such operations be allowed to start. The commission would not only welcome increased jurisdiction but believes that this is necessary to assure adequate service to the public and for the protection of the company now providing service.

Mr. Larson pointed out the fact that the electric railway service offers an opportunity of providing personal contacts, that is not possible in any other form of utility. He likened this to the personal contact method of sales of other commodities versus the less efficient method of mail or telephone selling. To accomplish this, trainmen should be educated in the policies of the company, and their attitude toward the public should be developed so that they will be good salesmen, as well as good operators.

The table that Mr. Larson presented, which is reproduced herewith, indicates that in the face of decreasing passenger revenues during the past five years an increased number of seat-miles during rush hours has been given, the capital invested to provide the service has gone up 38 per cent, and due to more economical operations the return on the capital has increased 42 per cent since 1920.

H. G. Monger, The Milwaukee Electric Railway & Light Company, delivered a paper on the co-ordination of street railway and motor bus transportation.

TREND OF ELECTRIC RAILWAY OPERATIONS IN THE GREATER MILWAUKEE
METROPOLITAN AREA, PER CENT OF 1920

	Revenue Passen- gers	Car- Miles Operated	Maximum Number Seats Operated in Rush Hours	Revenue per Car- Mile	Expenses per Car- Mile	Utility Capital Invested	Return on Capital Invested
1920	100	100	100	100	100	100	100
1921	92.7	93.5	98.4	102.7	100.4	105.6	112.6
1922	93.6	94.0	105.5	104.1	96.3	119.4	126.1
1923	98.0	96.6	124.7	106.6	97.3	125.8	129.6
1924	96.0	94.5	129.2	106.6	98.6	134.7	141.1
1925	95.4	96.0	143.4	103.4	96.3	138.2	142.8

Oliver Wynn, an east side high school student of Madison, Wisconsin, gave a talk on why he was interest in transportation from the standpoint of choosing this as a vocation.

Clyde Hedges, Mississippi Valley Public Service Company was unanimously elected chairman of the electric railway section for the coming year. John Lucas, The Milwaukee Electric Railway & Light Company was elected vice-chairman.

Following the sentiment developed in recent years some thought was given to a change in the name of the section. A motion was made and passed that the question of changing the section name

to Transportation Section be referred to the executive committee.

The entertainment provided in part by the local hosts, the Mississippi Valley Public Service Company, included pleasure and inspection trips in the surrounding territory of La Crosse and to the company's carshops. On Thursday evening, Aug. 12, an informal dinner followed by dancing was held at the Pioneer Club. On the afternoon of Aug. 13 three choices were available, golf at the La Crosse Country Club, an automobile trip to Coon Valley or a fishing trip to Galesville.

Safety Appliances on Electric Freight Cars

THOROUGH study concerning the safety appliances which should be installed on traction freight cars will be made by the Central Electric Railway Master Mechanics' Association. A circular recently sent out by the secretary relates an experience of the Indiana, Columbus & Eastern Traction Company. Ten box cars were built for this company at Chicago Heights, Ill., and shipped on their own wheels over the Big Four Railway. An Interstate Commerce Commission inspector found one of these cars in the Springfield yards of the Big Four Railway and discovered that it was not equipped according to the U. S. Safety Appliances Standard, being short several end grab handles, all four ladders and the running board. At first he refused to permit the Big Four to deliver the car to the traction company until these devices had been put on. F. J. Foote, superintendent of motive power and equipment of the I. C. & E., took up the subject personally with the inspector. He explained that the running board would be a menace to the men rather than a safety device on account of the danger of men on top of cars coming in contact with live trolley wire. Moreover, on traction lines trainmen have no occasion to be on the roof

of box cars and are not required to do so, he said. From this it followed that there was no need for running boards or ladders. It was finally agreed to cancel the matter of running boards and ladders for the present and install a full set of grab handles.

After further consideration of this matter the I. C. & E. decided to equip all its cars as called for by the Safety Code with the exception of the running boards and ladders. As a result of this experience, Mr. Foote suggested that the subject be taken up for consideration at the September meeting of the Central Electric Railway Master Mechanics' Association.

In the Words of Lincoln—Plow Deeper*

Some Important Problems of the Industry Are Better Service, Better Employee Understanding, Traffic Regulation and Tax Reduction

BY FRANK R. COATES

President American Electric Railway Association

DURING the last year I have had the great dual honor of serving as President of the American Electric Railway Association and the Central Electric Railway Association. In discharging the duties of these two offices, I have traveled somewhat extensively, and had an opportunity to observe first-hand many local transportation situations. This address which you have done the honor to request will probably be the last that I shall make prior to my final talk before the annual convention of the American Electric Railway Association in Cleveland, Ohio, on Oct. 4. Therefore I am going to try to summarize for you some of the outstanding conclusions that I have reached in my year of observation in the electric railway field.

More than 67 years ago, in an address to Wisconsin farmers Abraham Lincoln, then merely a country lawyer from down in Illinois, uttered some advice which I think might well be adopted today by local transportation men. "Plow Deeper," was the crux of Lincoln's remarks. The soil, he added, never has been pushed to half its capacity.

That statement, "The soil has never been pushed to half its capacity," seems to me to fit the local transportation situation today. While it is true that there are more forms of vehicles than ever before, it also is true that people are riding as they never have previously. Admittedly, despite the best efforts of rubber heel manufacturers, the people have practically forgotten how to walk. It is a commercial fact that because of this lack of walking, in great part, the shoe manufacturers of this country are producing only half the number of shoes of which they are capable. The situation has become so serious that shoe manufacturers have recently introduced a light summer shoe and are urging people to use different weight shoes in different seasons.

You need only to look around you to see that the riding habit is increasing. The number of automobile riders alone proves this. In fact, the figures of our own industry also prove it. In 1902, when there were practically no automobiles, the average number of street car rides annually taken by each individual in the United States was 61. In 1925, with approximately 20,000,000 automobiles, the average number of electric railway rides per inhabitant of the United States was 115.

People can be made to ride more just as Lincoln said land could be made to produce more, but only by "Deeper plowing." I am not so unmindful of the great differences in various local transportation problems to say that one scheme of intensified plowing for business is applicable to all of them. At the same time, I will say that most of

the recognized principles of such plowing will fit anywhere. Let me suggest just four kinds of plowing which, if done assiduously, will, I am sure, bring better business crops to the great majority of local transportation companies in this country. They are these:

- Plow deeper for better service;
- Plow deeper for better employee understanding;
- Plow deeper for traffic regulation;
- Plow deeper for fair tax reduction.

I have placed service first in this plowing schedule because without good service, no local transportation company can or should survive. It is an old saying, but a very true one, that transportation companies must regard themselves merely as merchants dealing with rides and that they must make their goods attractive or they cannot sell them.

GOOD SERVICE INVOLVES ALL DEPARTMENTS

Good service covers a multitude of things. It extends all the way from the activities of the head of the local company to those of the most minor employees. It particularly touches the kind of equipment which a company furnishes. It involves clean cars, a comfortable ride, courteous service and a thousand and one other similar things. It is the one big thing that companies have to sell.

So much has been said in recent years at electric railway meetings about good service, that many companies have come to regard the term in an abstract manner. Speakers chant about good service and the pleasing financial results that it brings, but all too often the whole subject is handled in a very vague manner. Men go out of meetings saying good service is quite necessary, but wondering just what all the shouting is about.

I want to be a little bit more specific. I want to point to a company that is making good service pay. It is not the only company in the country or in Wisconsin that is bringing about this much desired result but it is one of the activities that is very pertinent to this meeting. It is pertinent because it refers to the company managed by Nels Rasmussen, who was chosen chairman of the meeting in which we are now participating. I take the story of the activities of his company not from him, but from a copy of the *Wausau Daily Record-Herald*, for Friday evening, July 30, which recently came into my hands. That paper said in part about the service of his company:

Street car patrons of the city are elated these days over the riding comfort of several of the smaller city cars which have been remodeled on the interior. Four of the small cars, which have a capacity of 28 persons, have all leather upholstered seats with springs that add greatly to the riding comfort. The leather seats, together with the rubber flooring, give the car a cleaner and more sanitary appearance on

the interior. The rubber flooring is $\frac{1}{2}$ in. thick and has good wearing properties. The new floor coverings are easier to keep clean than the lumber flooring that had begun to show wear.

According to Nels Rasmussen, superintendent of railways for the Wisconsin Valley Electric Company, the cars were remodeled at a cost of \$600 per car. He also stated that all the cars owned by the local traction company would be repainted on the interior and exterior within a few weeks. The remaining three small cars will be remodeled with leather seats and rubber flooring in the near future.

The electric company operates eight large cars, with a capacity of fifty-two persons each, in addition to the seven cars of the smaller type. The railways superintendent announced that more transportation equipment will be added to the service next fall.

Few persons in the city realize the number of street car patrons the local company serves daily. The number of fares for the city last year up to Jan. 1, 1926, totalled 2,629,000. The electric company enjoyed the greatest business last year since the inauguration of the surface lines and the number of fares for the first six months of the present year shows a substantial increase over the same period of last year, the railways superintendent declared today.

The success of the company to which I have just referred must be due in great part to improved service. And that improved service was supplied at no great cost, about \$600 per car according to the newspaper statement.

This is the most eloquent answer to the numerous electric railway managers in many parts of the United States who say that they would give good service if they had the money. The cheapest things in the world to provide that will produce the largest returns are clean cars and courteous service. The difference between good and bad local transportation service often is, to the eyes of the customer, just the difference between dusty and wormy prunes in an open bin offered by a grouchy clerk, and clean sweet inviting fruit packed in a well labeled Del Monte can and sold by an obliging salesman.

SELLING PRUNES AND RIDES

If all of the hundreds of millions of words that have been printed regarding what good service is have not sufficiently educated the local transportation industry, it needs only to visit the stores of successful and unsuccessful local merchants in order to grasp the fundamentals. There is not one iota of difference between properly merchandising a prune and a ride. It is all a question of making the thing for sale attractive to a prospective customer.

It is especially gratifying to me to note that the plowing for employee understanding has been much deeper in transportation circles during recent years.

Progressive managements in all lines of business endeavor have come to realize that two of the first essentials to business success are honest endeavor on the part of the company, and a thorough understanding and sympathy with that endeavor on the part of employees.

Employees cannot be expected to delve deeply into company problems unless they are encouraged by the management.

There is no one thing that will carry a man farther in business today than the ability to get along with the public. Certainly the electric railway employee has a most unusual opportunity to show his capability along this line.

*Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, La Crosse, Wis., Aug. 12-13, 1926.

Perhaps there is no better illustration in the history of the world of a man making a success through understanding human nature than the life of this same Abraham Lincoln, who told the Wisconsin farmers to plow deeply. The basis of Lincoln's whole success in life was his understanding of the masses of the people. He understood them primarily because he was one of them, but also because he endeavored always to understand and sympathize with them. What a conductor or an executive he would have made!

SOME PROBLEMS TO SOLVE

The traffic congestion problem, caused chiefly in cities by parking, is one which is going to require deep plowing by local transportation men. They have side-stepped it for years in many communities, but the time is rapidly coming when they no longer can ignore its presence or try to get the matter handled by some other agencies than their own.

It is daily becoming more apparent that the local transportation managements must make a fair, upstanding open fight against traffic congestion in behalf of the majority of local travelers who are their patrons. Four out of five persons who use any kind of vehicle in city streets, ride street cars, and the progress of this 80 per cent is being seriously impeded by a very small minority. Incidentally, this is hurting the business of local transportation operators, and will continue to hurt them until adjustments are made which will accord fair treatment to street car riders.

The tax situation is one that has been grossly neglected by the industry generally, and here is need for more deep plowing. There has long existed a lack of agreement among electric railways as to what constitutes a fair tax, and as a result today this industry is taxed more unfairly perhaps than any other in the United States. In round numbers 10 cents out of every dollar of revenue goes for taxes.

The cure for this situation is intensive educational work by local transportation managements. It is not enough for them merely to say that taxes are too high or unfair and seek legislative relief. They must dig down deep into the facts and prove the unfairness. The story must be carried back to the individual who, in the end, is the controlling factor with state legislatures and the power that must eventually give the industry relief.

The gross-net tax seems to be a fair tax. If the industry can agree on this as a fair tax, then it is the duty of every electric railway man to get behind it and urge its general adoption by all legislatures.

I have touched only the high points of problems confronting the industry. There are many more which I have not touched. Just as Lincoln said of farming, "Every blade of grass is a study," so I say that every blade of grass in the transportation field—the rider, the employee, the cars, the taxes, the parking problem—are each a study. They offer an exceptional opportunity for the keen-minded, ambitious man who wants to overcome obstacles and make a monument of his work. They offer a discouraging prospect to the drone,

Opportunities for Good Public Relations*

Five Ways by Which a Transportation Company Can Improve Its Status in This Respect—Personal Contact with the Purchaser Is a Valuable Asset

By C. R. PHENECIE

Vice-President Wisconsin Public Service Corporation, Green Bay, Wis.

PUBLIC utilities have extended and enlarged the scope of human powers and apparatus to a point where humanity, as viewed from the standpoint of hundreds of years ago, has become composed of supermen and women. I do not mean wholly improvement in material welfare, but also in the spiritual welfare as well, because we have a happier, fresher, fuller and more altruistic life today, if we as individuals take advantage of the opportunities which we have before us. The amazing growth of the public utility industry is proof that the public who use gas, electric and street railway service, recognizes its value. Do they also recognize its cost, its problems, its responsibilities continually to progress and develop and serve?

The great problem of public relations is the problem of this understanding. This involves continued telling and retelling the public in attractive and interesting ways and by the more convincing and forceful way of providing good service, the needs and conditions which are constantly before the public utility industry. A street railway or bus line, because it transports persons, has a privilege of inestimable value in this great problem of public relations, not enjoyed by any other public utility to the same extent. When viewed from the standpoint of the satisfaction of the customer, that method of selling which brings about a personal contact of the customer and the sales representative, stands out pre-eminent. Advertising, direct by mail solicitation or any other method of transacting business than that of personally conducting the transactions, may be successful but never to the same extent as the earnest, honest, straightforward, courteous, personal, face-to-face methods. This then, gentlemen, is the privilege of your business.

Thomas A. Edison once said that nobody was doing a really good job until everybody recognized it as a good job. This certainly is true of the public utility. To understand the public involves on our part a better understanding of how the public thinks and why it thinks as it does. We must understand the motives and desires and purposes of our people, and when we do we understand those things which sway peoples opinions. We have but partially solved the problem of public relations.

The problem still remains for each of us to work out how this much-sought-after good public relations can be obtained. In my judgment, the first and most necessary step to obtain good public relations, is good public service. Of course we all realize the practical limitations imposed by the earning capacity of a property or the riding

potentialities of its people, and we cannot offer a service not justified by the conditions. Offering advanced and progressive service will tend to promote the business and will do more than anything else to keep before you a constant, encouraging, kindly attitude on the part of your customer. Clean equipment, courteous conduct and reasonable attention to the incidental things which the rider likes are also necessary. All of these things go to make up good service.

The second thing that I feel is necessary for good public relations, is public understanding. To obtain public understanding we have to tell our story to the public, and we have to tell it many times and in many different ways. If your business is a clean, legitimate business, then as a public utility operator without competition, you have no need of any secrets from your customers. Make this fact clear and be prepared to give any facts to your public that it may desire. Advertising, as you know, can be very ingenious and subtle, and in my humble opinion, such advertising is oftentimes tremendously more effective than the bald solicitation of business. Make up each year an advertising budget as a part of your regular legitimate operating expenses. You will find it a good investment.

The third step towards obtaining good public relations in a practical way, is I believe, to have every utility executive, and to encourage every employee, to take an active part in all community affairs, simply as good citizens. The company may support a reasonable amount of the expenses which might be incurred by employees or executives in this work.

The fourth point towards good public relations, is to be sure that your own organization, your own employees give out such utterances of loyalty and understanding of the company as will reflect to the company's credit. Gentlemen, nothing can do your company more harm in the public eye than to have your own employees go about the streets knocking your policies and misstating your problems. Therefore, you must sell your organization to its company and the personnel of your company if educated to your problems and equipped to talk them in a proper way, can be through these added points of contact with the public of tremendous value to you. A man on a car or in a bus can make or break you.

The fifth point that occurs to me as of vital importance for good relations, particularly to a transportation agency, is the handling of your claims. This is one of your great opportunities to bring about good public relations. One might think that the trying circumstances under which claims are often handled and the necessity for an unsympathetic reception of some recital, would make it far from pro-

*Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, La Crosse, Wis., Aug. 12-13, 1926.

pitious for good public relations. On the contrary with proper and honest attention towards claims, the best of public relations may be obtained. When a claim is presented to you by letter or in person, try to get the other fellow's point of view first before you impress him with your point of view. Remember that 90 per cent of the people are essentially honest and if a claim is presented to you, no matter how little at fault you may be, at least understand the loss or damage or suffering that the claimant may have experienced, even if entirely through his own negligence. Some of the rules that I believe should be followed in handling claims in a practical way are these:

Never decline a claim as soon as it is made. Take it under advisement and inform the claimant that every fact and circumstance cited will be investigated. Listen courteously and patiently to

every claim. Keep constantly before your claimant your continuous efforts for safety, make him understand that every man and woman in your employ hears in some way or other about safety constantly. In accidents involving collisions or injuries around cars or buses, make the claimant understand in a tactful way, that his claim is a direct thrust at the operator of that vehicle, and will mean a direct personal loss to that operator if justified. And last, settle all claims in a broad, sympathetic and kind way. If at all possible make your position clear and justify it always to your claimant. You will find that by taking this extra pains and trouble in settling your claims that you will sow your community with understanding people, and you will find your towns full of open minded and fair people who may be called to sit in judgment as jurors.

Circulating the Load Through the Rear Exit*

BY P. W. GERHARDT

Assistant Superintendent of Transportation
The Milwaukee Electric Railway & Light Company

EFFORTS to extend one-man operation to larger units and to lines of heavier traffic met at first with considerable opposition on the part of the public. In general their arguments could be summed up as follows: One-man cars are not as safe as two-man cars; one-man cars are slower in operation and slow down traffic; one-man cars are more congested at the entrance and exit doors.

The first argument, that of safety, was met by the superior safety devices with which the one-man cars are now equipped.

The second and third objections could not be successfully met, however, as we had to admit that there was a small slowing down in schedule speed and there was undoubtedly congestion on the cars. For even though we might persuade our passengers to "move to the rear" there would yet be the problem of aisle friction or the annoyance of one stream of passengers moving toward the rear and another moving toward the front. Moreover, the short-ride passenger would not move away from the doors as he expected to get off within a few blocks and did not care to be caught in a jam. Then there was also the problem of "street friction," due to the would-be passengers massed about the exit and entrance doors. All of this combined to slow down passenger movement and consequently the schedule speed.

Then came the treadle door to solve our problem and make the one-man car really operative on any route. The one-man operator on a car performs the duties of both motorman and conductor, but not simultaneously. While the car is standing he acts as a conductor collecting fares, making change, issuing transfers and assisting passengers on and off the car. This done he ceases to

be a conductor and takes up the duties of a motorman, starting, operating and stopping his car, ever with his attention focused on the track ahead to avoid accidents. Thus he is always busy and does not have the alternate periods of rest that a motorman or conductor on a two-man car has. It is essential, therefore, that everything possible be done to assist him in his work and keep him free from worry or annoyance.

With a car equipped with the modern safety devices, air operated front doors and automatic treadle door at the rear, we believe that we have gone a long way in assisting the operator to better perform his work and to insure safety of passengers.

On first thought it might seem that the best results from the treadle door one-man car would be had by requiring all passengers to leave through the rear exit. In Milwaukee, however, we provide a front exit also and permit the passenger to choose which exit he shall use but we recommend the rear door. The front exit, being in view of the operator, is not treadle equipped. As all of our passenger stops are near-side we find that some passengers prefer to use the front exit except when the car is well loaded, in which case both exits are used. At transfer points there is, of course, an advantage to the transfer passengers in using the front exit and in general we believe that our patrons prefer to exercise a choice of exits rather than to be required to use one end or the other.

Some study has been made to determine the proportion of passengers who leave by either door, also of the time required per passenger, but as yet we have not sufficient data from which to draw final conclusions. We did, however, make a very exhaustive study of boarding passengers on our Walnut Street Line from which we found that of all stops made to pick up passengers the following was the distribution:

Number of Passengers	Per Cent of Stops
1.....	36
2.....	22
3.....	13
4.....	8
5.....	5
6.....	4
7.....	3
8.....	2
9.....	1
10 or more.....	1

From this it will be noted that more than 84 per cent of all stops were for groups of five or less. It is probably safe to assume that passengers will leave the car in about the same grouping in which they board.

The advantages of the treadle door and other improved operating methods in Milwaukee can best be shown by a brief review of the history of one-man operation there. On July 19, 1921, one-man cars were started on the 35th Street Line and on Aug. 1, 1921, on the 27th Street Line without very serious opposition. On Aug. 1, 1923, one-man operation was started on the Center Street Line, after considerable opposition had been voiced against it. These three lines provide cross-town service and do not enter the downtown business section. The cars used on these lines were equipped with the standard safety devices but did not have treadle doors, all passengers boarding and alighting at the front end.

One-man cars were ordered on the Clybourn Street Line Jan. 1, 1925, after considerable protest had been made at the public hearing held by the Wisconsin Railroad Commission. A large share of this protest came from patrons of the 27th, 35th, and Center Street lines who testified that one-man service on those lines was less satisfactory than the former two-man service. The Clybourn Street line runs through the downtown business section and the commission in its order for one-man cars specified that they must be equipped with treadle doors which were new and untried devices at that time.

The next line on which the company sought to operate one-man cars was Walnut Street. This is a fairly heavy line running through the downtown business section and into a high-class residential section. The hearing of this proposal brought out some very bitter protests from the city officials as well as residents along the route. The commission considered the matter for several months, then ordered one-man operation to start March 1, 1926. A number of protest meetings were held and the common council ordered the city attorney to request a rehearing of the matter before the commission. The rehearing was granted and the action of the commission in granting the company permission to operate one-man cars on Walnut Street was severely criticised. Some of the objectors went so far as to threaten rioting if the company should attempt to operate one-man cars.

It was significant that the only witnesses whose testimony was favorable to the company were patrons of the Clybourn Street line. These testified that the service on their line was satisfactory. The commission then amended its order to grant a trial operation of one-man cars for six months, beginning May 23, 1926.

*Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, La Crosse, Wis., Aug. 12-13, 1926.

So successful has been this operation and so well do the people think of it that all opposition has been withdrawn. When the commission recently held a public hearing to consider a proposal to operate one-man cars on the Wells-Downer line, the heaviest line in the city, not a single person appeared in protest.

Our Walnut Street one-man line operates over the same tracks as the 12th Street—a two-man line—for 2½

miles and there is no difficulty in maintaining the same schedule speed. As a matter of fact there is a much closer adherence to schedule time under one-man operation than there was under two-man operation.

We firmly believe that through the circulating load we have so thoroughly sold the one-man car to our patrons that there will be no serious objection to further extension of their use.

Accident Prevention from the Executive's Viewpoint*

**Humanitarian Attitude Is Needed to Obtain Highest Degree of Success—
Investigation of Accidents to Determine Causes and Prevent
Their Repetition Has Reduced Them Materially**

By B. W. ARNOLD
Assistant General Manager
Chicago, North Shore & Milwaukee Railroad

NO EXECUTIVE can question the fact that safe operation contributes as much to a good or bad showing on the balance sheet as could any branch of his business. The title of this paper is so broad, and gives such an unlimited amount of food for thought, that no executive can help but appreciate the necessity for its application to his own property.

I am not certain, however, that all men holding executive positions with smaller utilities in the State of Wisconsin, have as clear and definite a viewpoint as I do upon this subject. The larger utilities, which employ thousands of men, are able to make exhaustive studies of the real causes and costs of accidents and the necessity for safety. They can set up safety departments in their organizations that will be just as important as the transportation, accounting or traffic departments.

ACCIDENTS ARE EXPENSIVE

When the manager of some small utility reads accident figures and costs compiled by the larger companies, he is no doubt somewhat impressed, but nevertheless does not realize that the same figures, in ratio to size of property, apply to his own. I have had brought to my mind forcibly a great many times during the past twenty years, the real meaning of safety and the tremendous cost of failure to apply it.

All too often companies embark on safety campaigns which, like a display of fireworks are beautiful to look at, but all too soon fade away. Unless we are able to convince the public who are our patrons, that we are sincere in our endeavors for safety and accident prevention, and unless we continue these efforts 365 days in every year, the one day that we vacation may prove our undoing.

In a great many companies the formerly much talked of claim agent has combined his duties as claim agent with those of safety director and in his new line of work has been able to save much more money for his company and build for it, better public relations than he ever did when his one thought was to secure the names of the injured, along

with the proper witnesses, on the dotted line on the bottom of the release blank.

In the United States we have an organization unlike any other organization in the world. If managers of small properties would fully realize and appreciate the value of the National Safety Council (the membership fee in which is nominal) they would undoubtedly reap tremendous rewards. Just at present the National Safety Council is headed by a member of the North Shore family, Charles B. Scott, head of the bureau of safety, which serves in an advisory capacity over all the utilities known as the Insull properties. These utility companies are distributed over some twenty different states and give service of one kind or another to over two thousand communities. About fifty thousand employees are thus within the scope of the safety activities of this bureau. While I hesitate to bring to this meeting experiences of my own property I cannot refrain from giving you the results accomplished by this bureau and then allow you to decide in your own minds whether safety and accident prevention should have an active place in your organization.

During the first five months that the bureau of safety started the accident prevention work on the Chicago, North Shore & Milwaukee Railroad there were 82 accidents to the public. During the same period in the second year of accident prevention work there were 36 accidents to the public, or a reduction of 56 per cent. During the first five months there were 49 employee accidents. After a year of accident prevention work, for the corresponding period this figure was lowered to 36 employee accidents, or a reduction of 27 per cent. Accidents of all classes during these same periods were reduced from 190 to 99, or 48 per cent.

SAFETY WORK PAYS LARGE DIVIDENDS

Can there be any doubt that organized safety work will pay large dividends on any property? While electric railway people are mostly concerned about accidents to the public, emphasis must also be placed upon the responsibility of a company with respect to the safety of its employees. It has been proved conclusively that a company which realizes this responsibility and fulfills its entire obligation.

has a much better accident report and much better public relations than one which is concerned only in the prevention of public accidents because they seem to be more expensive.

Notwithstanding many companies have been engaged in active safety work in a more or less definite and systematic manner for eight or ten years, there are still many executives who look at the question as purely a financial one—and all too few look at it from the humanitarian viewpoint. The highest degree of success will be attained by those who are able to view both sides. The average trainman is a man of intelligence; otherwise he could not operate a train successfully under present-day difficulties. He should be treated as such and as far as possible taken into confidence of the company and made familiar with its many problems, financial and physical, as well as its policy with respect to the public.

All this is safety work. No one man can do effective safety work alone. The first necessity is to have the executive fully sold so that he in turn can secure the confidence and the sincere support of his superintendents, foremen and employees.

PREVENTION BETTER THAN CURE

Who can doubt the wonderful results accomplished in the short time that utility companies have been permitted to have representatives make safety talks in the public schools. Between 1905 and 1910 far-sighted executives began to realize that accidents were wasteful, that they interrupted production and destroyed confidence of the public. They began to study accidents asking, not "Whose fault was it?", but "How could it have been prevented?"

On the North Shore we have an accident investigation board which is required to investigate accidents in a great deal the same manner as in a court. Its members take testimony and make a report to the president, not on the proposition of who was at fault, but on how it could have been prevented and what safeguards are necessary to prevent a repetition.

To give a correct viewpoint of accident prevention to the executive we have only to show the economic aspect of the safety movement.

Ask any mother and father to put a dollars-and-cents value on their children. You couldn't buy them if you could offer billions. But human beings have an economic value—a worth to society as a whole which has been set by states at from \$5,000 to \$25,000. That is the compensatory value of a human life as reckoned by economists and lawmakers.

If we compute the average value of a human life from these figures we would find that \$10,000 is generally reckoned to be compensation for death. At this figure, the 85,000 lives destroyed last year by accident in this country are worth \$850,000,000. In the last five years there have been over 400,000 persons killed in accidents. At least 75 per cent of these accidents were avoidable. That is, with the exercise of a reasonable amount of caution on the part of the person killed or some other person or persons, the accident would not have happened.

We do not reckon the price of death

*Presented before the Electric Railway Section Wisconsin Utilities Association, La Crosse, Wis., Aug. 12-13, 1926.

rightly in all cases. What of the boy and the girl who have their lives ahead? An avoidable accident suddenly scoops their heritage from them. It is generally accepted to be true—or is it?—that life is the most valuable possession we have. But that is an intrinsic value, like a family heirloom, of little value to others.

ALL OF US PAY FOR ACCIDENTS

But we all pay for accidents. The annual loss per person in the United States is estimated at \$50. Every year we pay as much for accidents as the much-discussed French debt. Insurance rates depend on accident costs. Automobile drivers in New York City, for instance, pay an average liability insurance premium of \$119, while drivers in Portland or Denver pay only \$27. In Chicago the rate is \$45, in Boston \$56.

I believe to the railroad man the automobile has presented one of the most serious hazards. Have you ever read the sayings of Abe Martin? They are sparkling with wit and wisdom. The other day Abe, having in mind the dangers of our modern traffic, said, "It's getting to be so that the only safe way to cross the street is with a cow." The average automobile driver is very careful about taking any chances with "Bossy." "Many cows have been sacrificed to teach motorists to drive carefully when they meet up with her, but the sacrificial lesson has been taught."

Now you hardly ever hear of a driver having a collision with our friend the cow.

A cow is less conspicuous, with her quiet manner and poise, than the nervous wig-wag shimmying and blinking of signal lights and noisy bells to warn a driver that a high-speed train is approaching. She is less colorful than the striped gate extending across the highway. She is less forbidding than a crossing watchman with a warning sign in his hands.

We wonder why this greater respect, upon the part of drivers, for the cow, when so many lives are being snuffed out each year because of disregard for the wig-wag, gate or watchman.

Grade crossing accidents will continue to occur, mark you, we say occur and not happen, until the drivers of automobiles learn to respect the warnings provided by railway companies to the same degree that they now respect the cow.

In conclusion may I say that out of gatherings of this kind with expressions from many, a great good can be accomplished. The executive whose viewpoint does not embrace safe operation of his property is destined to failure. My thought is first, to make safety popular; second, to investigate carefully, thoroughly and intelligently every accident and set up proper safeguards to prevent its repetition; third, to be sincere in the work for safety. Only in this way can conditions be improved.

Pneumatic Operation Facilitates Traffic Movement*

BY OSCAR A. BROTEN

Western Manager National Pneumatic Company, Chicago

CONTROLLING and expediting passenger traffic has been given very careful and continued study since the first days of transportation. This has a direct bearing upon the increase or decrease of net revenues; therefore it is absolutely necessary to treat this subject with utmost care. In the method of controlling the passenger movement in loading or unloading, method of fare collection, distribution of load, etc., it is the final result of maximum speed and safety for which we are all striving.

One-man operation is rapidly increasing in all parts of the country with various types of cars and with it comes the decided reduction in operating expense. Successful and satisfactory operation of cars in one-man service is dependent upon the installation of proper safety devices and proper passenger control. The one-man safety car, originating with the Birney type car, was indeed a Godsend to the industry as it started the trend of operation in the right direction. From an operating point of view the main objection was the congestion of loading and unloading passengers through one small front door. On several properties this was partially overcome by fitting the car with separate entrance and exit doors at the front platform; however

this did not solve the problem of evenly distributing the passenger load or eliminating the cross friction in the aisle.

Later one or two properties started the circulating load method of service, with front entrance and rear exit of passengers, the rear door being actually opened and closed by the motorman from his position on the front platform. This, although a step in the right direction, did not meet the requirements of the industry, as with this method the rear door is in the open position much more than necessary thereby inviting the stranger or car ride cheat to enter through the open rear door instead of the front entrance door. Furthermore during winter months an excessive amount of cold air is admitted into the car. The greatest objection however, is the possibility of accidents caused by the motorman closing the door on an outgoing passenger.

TREADLE DOOR OVERCOMES OBJECTION TO ONE MAN

The problem of overcoming these objections and difficulties was solved with the development and distribution of the automatic treadle exit door, which insures an entirely safe and fast car operation with the circulating load method of passenger for all types of cars in one-man service.

Although the treadle door has been before the industry only a short time approximately 2,500 devices are either

in operation or on order at this date, which is proof that this device, together with the circulating load operation, has been accepted by the industry at large, and in all kinds of climatic conditions.

It is important at this point to mention that the folding step has decided advantages over a stationary step in that the folding step insures the best operating conditions with treadle door operation, and also eliminates foreign matter, such as snow, ice and dirt, on the step.

For the past 25 years then has been a continuous effort to improve the methods of handling passenger traffic and it is our belief that the automatic treadle exit door together with the circulating load service completes for the industry the cycle of safety improvements which started with the one-man safety car.

A brief explanation of the operation of the treadle door is in order.

After the brakes have been applied and the car stopped the motorman moves the handle of the rear door control valve to a "Released Position." This is impossible until the air brakes have been applied. The passenger steps on the treadle plate which is set flush in the floor directly in front of the door, the door opens automatically, the passenger or passengers step out and when entirely off the step the door closes automatically notifying the motorman through a door signal light. The motorman releases the brakes, which automatically returns the handle of the rear door control valve to a door-locked position. At each stop the same operation would be duplicated. The treadle door is arranged to operate in conjunction with the approved one-man safety car devices.

TREADLE DOOR APPLICABLE IN BUS SERVICE

The circulating load idea with rear exit treadle door has been adopted by several bus operators, particularly those controlled by street railway properties. This method of operation is equally as necessary for city bus service as in street car operation of the same type due to the fact that the general body construction of buses includes only one small door at the front through which the passengers must both enter and leave. In addition to this the aisle space on buses in general is considerably narrower than on street cars. Therefore aisle friction is proportionately increased and can be practically eliminated, through use of the circulating load system.

It has been found desirable to use this method of operation on both single and double deck buses operating in one-man service and in your further consideration of bus operation this question should be given careful attention.

Various manufacturers have developed new apparatus or made refinements in present design equipment to secure quicker acceleration, faster car speeds, better braking, etc., and therefore it is up to the operating companies to keep the cars moving on faster schedules by increasing the speed and efficiency of the passenger movement and the elimination of excessive car standing time.

*Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, La Crosse, Wis., Aug. 12-13, 1926.

Co-operation in Accident Prevention

Pacific Claim Agents Association Convention Considers Methods of Reducing the Number of Automobile Accidents

MEEETING at the Clift Hotel, San Francisco, on July 22, 23 and 24, the Pacific Claim Agents Association listened to an interesting series of papers dealing with the subject of accident prevention.

Speaking on the subject of compulsory insurance for automobiles, Arthur L. Levinsky, claims attorney Stockton Electric Railway, said that at the present time in California there are some 1,494,891 licensed motor vehicles and an additional 54,202 which are exempt from payment of fees. Of the total of 1,549,093 motor vehicles somewhere between 15 and 25 per cent carry insurance. Assuming that the latter figure is a proper basis for computation there are approximately 386,523 insured and 1,159,590 uninsured. Opinion is divided, he said, as to whether or not the passage of a law making it compulsory to carry accident insurance would cause motorists to be more or less careless.

Organization of a commercial drivers' club as a method of enlisting the co-operation of motorists in accident prevention was explained by B. F. Boynton, claim agent Portland Electric Power Company. The club in Portland now has 600 members, and in the six months' period since its organization commercial drivers' accidents have been reduced 50 per cent, he said.

Thomas G. Aston, claim agent Spokane United Railways, spoke on how to enlist the aid of employees in claim department work. He said that the idea must be removed from their minds that the claim department man's sole duty is to criticize their mistakes. An attitude of general interest in them and in their work should be fostered, he said. The claim agent should know where every employee of the company lives. The Spokane United Railways has a large map with a pin located to show the home of every employee. When an accident occurs the map is consulted and any employee living in the vicinity is questioned.

When the railway company has a strong case it should not compromise with a claimant in the opinion of W. H. Moore, claim agent San Diego Electric Railway. In the case of claims the merits of which are debatable on the other hand litigations can sometimes be avoided by mutual concessions.

At the conclusion of the meeting officers were elected for the year 1926-1927, as follows:

A. L. Levinsky, Stockton Electric Railway, Stockton, Cal., president.

F. J. Furman, Butte Electric Railway, Butte, Mont., first vice-president.

A. W. Worthen, Tacoma Railway & Power Company, Tacoma, Wash., second vice-president.

B. W. Fernald, Key System Transit Company, Oakland, Cal., third vice-president.

B. F. Boynton, Portland Electric Power Company, Portland, Ore., secretary-treasurer.

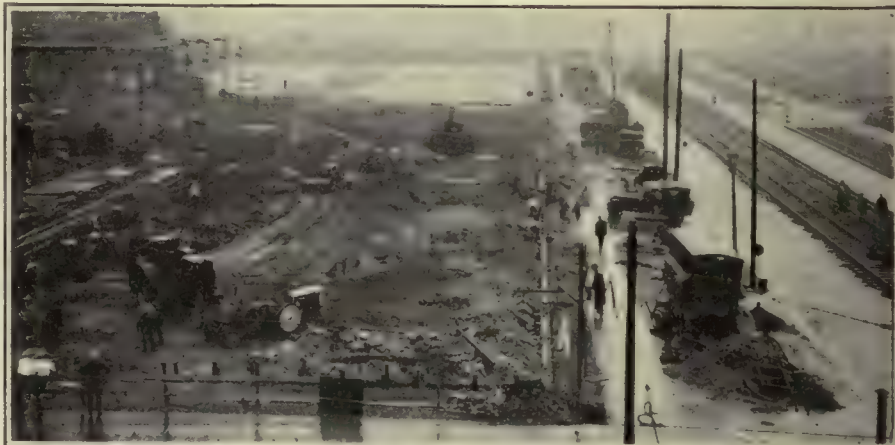
Executive Committee: J. H. Handlon,

San Francisco, Cal., chairman; Thomas G. Aston, Spokane, Wash.; W. H. Moore, San Diego, Cal.; Charles A. Blackburn, Butte, Mont.; F. D. Oakley, Tacoma, Wash.; H. K. Relf, Portland, Ore.;

A. M. Lee, Seattle, Wash.; C. M. Roberts, Los Angeles, Cal.; S. A. Bishop, Los Angeles, Cal.; C. R. Peck, Portland, Ore.; V. F. Bennett, San Diego, Cal.

Making Ready for Cleveland Exhibit of the A.E.R.A.

The upper picture was taken Aug. 9; that below was taken Aug. 14.



CONVENTION time is not far away. It may seem so to many, but not to the Cleveland convention committee. The above views show that much more than a start has been made to house the greatest of railway conventions and exhibits—that of the American Electric Railway Association, to be held Oct. 4-8. The pictures were taken looking north from St. Clair Avenue near its intersection with East Third Street through what will be approximately the center of this exposition.

At the right of the picture are the temporary tracks installed to service the convention. They connect, on the north, with the Pennsylvania and New York Central lines, and, on the south (in the foreground), with the Cleveland Railway tracks on St. Clair Avenue. Other connections will be made for the car exhibit. At the extreme right may be seen a corner of the City Hall, which faces the Public Auditorium.

The street through the center of the pictures (East Third Street) will be closed to traffic during the week of the convention from St. Clair on the south to Lakeside on the north.

On the left half of the upper picture the ground is cleared for laying the concrete floor of the new exhibition hall. In the background may be seen a large

area with the concrete floor completed, and in the right-hand corner of the new building is the portion of floor that was laid in the first four hours of Monday, Aug. 9.

In the middle of the picture are the remains of an old brick-and-wood stable which belonged to the city of Cleveland. The work was threatened with delay because of the slow progress of its dismantling. Saturday afternoon, Aug. 7, Charlie Clark soaked the interior with kerosene and burned out the woodwork; then threw a 1-in. steel cable around the base of the building and through a fall block connected it with a work train on the temporary track. In four hours the fire was out and the remains of the building are seen in the pit. Monday morning, trucks were busy throwing in the additional fill.

The lower picture shows the extent of progress made in five days. Grading has gone forward rapidly. The first track on East Third Street has been completed and the second one laid. The concrete floor is extended.

Other pictures will be published from week to week in order that the readers of this paper may check up the progress of the work and be assured that everything will be complete and in readiness for the convention.

The News of the Industry

Commission Powerless

New York Body So Rules With Respect to Fares in Albany and Rensselaer —Future Course Not Stated

A decision of far reaching importance was rendered by the Public Service Commission of New York on Aug. 18. In the matter of the application of the United Traction Company, Albany, for an increase in its fares in the Capitol district from 7 to 10 cents, the commission reaffirmed its former decision that the Legislature has taken away its power to regulate fares as against local franchise fare restrictions in the cities of Troy and Rensselaer.

The company had sought to increase its fares on its entire system. The cities contended that the commission was without jurisdiction to hear the petition for increased fares on the ground that no power had been conferred on the commission to abrogate or nullify the fares and conditions fixed in the consents to the United Traction Company. The commission rendered a decision on June 23 and it was upon the petition for a rehearing that the decision just made was rendered. The determination reaffirmed on Aug. 18 held:

That the Legislature has revoked the power to regulate rates fixed in franchise agreements by the repeal of the statute conferring it, and that the Public Service Commission has no jurisdiction now to exercise such delegated authority, and that therefore evidence should not be received in this proceeding as to valuation, operating expenses and revenues of the lines of the United Traction Company within the city of Troy and the city of Rensselaer affected by such franchise agreements, except insofar as such evidence may be necessary to permit an allocation of the revenues and expenses of the system to those lines unaffected by franchises and over which the commission has jurisdiction to fix rates, and that the commission as a fact finding body must regard such agreements as valid and subsisting until they have been annulled or limited by a court of competent jurisdiction.

This leaves the United Traction Company in the position of being able to petition for an increased fare on such of its lines as are located outside the cities of Troy and Rensselaer only. Whether or not the company will appeal to the courts from the decision of the commission could not be learned on Aug. 18.

New Grant at Louisville Advanced

It now appears likely that the Louisville Railway, Louisville, Ky., will secure its long-desired franchise modifications. On Aug. 10 the lower board of the City Council, by a unanimous vote, approved the ordinance recently placed before the City Council by the company, but with certain amendments. The chief of these was that on combination rides, on street cars and buses of the Kentucky Carriers, Inc., a subsidiary company, the maximum fare would be 10 cents, instead of 12½ cents.

On street car rides the fare will be 7 cents straight, with 3 cents extra where a transfer is issued to a bus. On buses the fare will be 10 cents, whereas it is now 15 cents for single rides, or 12½ cents where tickets are bought. The bill will now go before the Board of Aldermen.

On Monday, Aug. 16, a conference was scheduled to consider amendments to the bill, to be participated in by the company, the railway committees of the upper and lower boards of the City Council, the Mayor, and City Attorney, as well as Board of Public Works. After agreements are reached at this meeting, the bill will go to the Aldermen, and if passed there, will be ready for the Mayor's signature, which is final.

Following the unanimous vote of the lower board of the Council it is indicated that there is not much resistance to the measure. Under the terms of the agreement the straight 7-cent fare

would remain in effect for a period of two years, after which there would be a readjustment, instead of the present barometer arrangement under which the fare is arbitrarily put up or down every six months.

New Ordinance for Interurban Introduced at Cincinnati

An ordinance has been submitted to the transportation committee of the City Council at Cincinnati, Ohio, by the City Solicitor which grants the Cincinnati, Hamilton & Dayton Railway the right to continue the operation of electric cars from Dayton to Cincinnati and over the streets of Cincinnati for twenty-five years. The ordinance was made necessary because College Hill, through which the railway runs, was not a part of Cincinnati when the original franchise was awarded. The ordinance undoubtedly will be passed at the next meeting of Council.

Rapid Transit Issues in Los Angeles

Review of the Trials and Tribulations of the Local Railways in their Efforts to Give the City of Los Angeles a System It Should Have but Does Not Deserve

THE rapid transit problem in Los Angeles remains unsettled as to the ultimate plan the City Council will adopt. The Plaza Union Passenger Terminal controversy, bitterly contested by the railroads for years, has injected several new factors into the issue. The Plaza Terminal plan for a union station in the northern part of the city for all steam roads entering the city was investigated by the Interstate Commerce Commission, after a ten-year dispute between municipal bodies on the one side and the Southern Pacific, Union Pacific and Santa Fe Railroads on the other. In 1916 a so-called "grade separation and union passenger station" case came up before the State Railroad Commission and the commission ordered the railroads to submit plans for the construction of a passenger union station at the Plaza site.

The railroads secured a writ of review from the State Supreme Court, which on Dec. 19, 1922, annulled the commission's order, known as decision 8,901, on the ground that the court could "see no indispensable relation between the elimination of grade crossings and the establishment of union depot facilities," and that the California Railroad Commission had no jurisdiction to compel the construction of a union station by any railroads anywhere in California. That power has been transferred to the Interstate Commerce Commission by the transportation act of 1920. The Railroad Com-

mission appealed to the United States Supreme Court, but again lost its case, for the decision of the California Supreme Court annulling the Railroad Commission's order was upheld on April 7, 1924.

The proceedings started in 1916 were reopened on Oct. 3, 1925, by the State Railroad Commission, on motion of the Central Development Association, and were set down for further hearing. These proceedings are now pending before the Railroad Commission. At the hearing held in Los Angeles during the last two weeks of April, 1926, lengthy and massive evidence was introduced by the city before the commission, while the railroads likewise presented many data and much evidence for their side of the question. The commission adjourned the hearing to review the evidence, fixing Aug. 2 as date of continuation.

When the city of Los Angeles placed its case before the Interstate Commerce Commission that body decided that "careful study of the Interstate Commerce Commission act convinces us that Congress has not conferred upon us the authority to require carriers to construct union passenger stations under conditions such as are here present."

No order, the carriers point out, was ever made by the Interstate Commerce Commission ordering a union passenger station in Los Angeles, as proponents of the issue claimed; or as the matter rests, there is no order outstanding of any commission requiring that a union

station be built. The Los Angeles Chamber of Commerce and other prominent civic bodies and associations passed resolutions and filed them with the Railroad Commission, in opposition to the Plaza Terminal site. They urged acceptance of the railroads plan, for a separate system of station facilities, elevated lines and grade crossing separations. They contended that the Plaza Terminal plan would take years to complete, whereas the railroad plan could be completed in eighteen months. Also, it was shown that the union station was unnecessary, and that any plan which leaves the electric lines out of the reckoning would be an incomplete solution to the city traffic problems, and create intolerable congestion. It was further contended that the Plaza Terminal plan would eliminate only the steam track grade crossings, and leave the Pacific Electric city grade crossings open.

The railroad plan involves the construction of an extension of the Pacific Electric Railway's elevated line from its present Main Street station to the Los Angeles River and across the river, where it will again come to grade, also connecting with an elevated extension to its private right-of-way at Fourteenth Street for southbound suburban traffic. This plan would take 1,200 trains of the electric interurban line off the downtown streets of Los Angeles daily, eliminate 18,000 grade crossing movements daily and afford relief to 50,000 passengers daily who use the 1,200 interurban trains of the electric lines to certain suburban districts.

Opponents to the railroad plans, backed by a leading daily paper, endeavored to impress upon the people the horror of elevated lines. To this end it featured during the election campaign photos of wrecks on elevated systems in the East, likewise giving the impression that the proposed elevated extensions in Los Angeles were to enter the main business streets. The railroads endeavored to dispel this impression by public announcements and advertisements that the elevated extensions were to be projected outside of the business district and to be constructed on private right-of-way.

ISSUE SUBMITTED TO THE PUBLIC

Despite the fact that the Board of Public Utilities approved of the railroad plan and asked the city to dismiss its case before the commission, the City Council remained neutral and passed a resolution to place the issue before the people to obtain a straw vote. The election was held on April 30 last. Proposition No. 8 on the ballot for a union station in Los Angeles, but not designating any location, received a majority of 42,779 votes. Proposition No. 9 for a union station at the Plaza, received a majority of 4,082 votes.

The election outcome is not final, binding neither the city nor the railroads as to the building or location of a union terminal. Prior to the election the railroads applied to the City Council for franchise to cross certain streets to construct 2.9 miles of elevated railroad, but not longitudinally over the streets of Los Angeles.

A new issue has developed by certain factions opposing the elevated issue and has come to the front to fight the

Kelker rapid transit plan, which calls for elevated lines and was adopted by the City Council. It will be recalled that the transportation committee of the Council, appointed in June, 1925, after the new city charter became effective, began a study of the proposed Kelker report and plan to work out means by which it could be financed and carried out. This plan also called for an extensive subway system in the downtown business district.

CHANCE FOR LOCAL LINE EXTENSIONS SMALL

Several weeks ago the Los Angeles Board of Public Utilities and Transportation issued a statement to the effect that there was no hope of any further car line extensions by the Los Angeles Railway until definite action has been taken on a comprehensive rapid transit plan, as involved in the Kelker-DeLeuw report, inclusive of the possibility of the unification of the Los Angeles and the Pacific Electric Railway systems.

The statement further outlined that it is impossible for the Los Angeles Railway system to finance any large capital expenditure until some definite plans have been acted upon for rapid transit or for unification of the two local railway systems. There is now pending before the State Railroad Commission for decision the application of the Los Angeles Railway Corporation for the reorganization of the company as a necessary precedent to refinancing. The franchise condition is such that the railway intends to apply for a resettlement of the franchise as soon as the people have adopted a procedure ordinance. Neither the city of Los Angeles nor the State Railroad Commission has any authority to order a street railway to extend any of its lines, and the Los Angeles Railway is at present unable, at anything like favorable terms, to raise capital to carry out new construction, betterments or extensions. This statement was addressed to certain communities that are agitating railway extensions in the city.

Decision Expected Soon in Suit of Illinois Line

The decision of United States Judge Walter C. Lindley of Danville, Ill., in the injunction suit of the East St. Louis Railway, East St. Louis, Ill., against the Mayor and City Council of East St. Louis, who contemplate tearing up the railway tracks on Third Street between Broadway and Missouri Avenue, is expected shortly. A temporary restraining order was issued by the court on May 29, last, and the question is whether the injunction shall be made permanent.

The railway contends that the tracks in question are necessary for the efficient operation of the balance of the company system, and further that the Illinois Commerce Commission and not the City Council has final jurisdiction over the tracks. The commission declined to take action on behalf of the company.

The franchise on the stretch of tracks expired on May 31 and the majority of the Councilmen have refused to renew it.

Advance in Utica Fares Allowed

The New York State Railways was authorized by the Public Service Commission on Aug. 19 to put into effect on its Utica Lines, including the city of Utica and adjoining villages, a 7½-cent ticket fare and a 10-cent cash fare. The present fare rate is 7 cents. The order is effective on Aug. 22.

The company is authorized to sell ten tickets or tokens for 75 cents, each token or ticket good for one ride with all transfer privileges. Where tickets or tokens are not purchased, the fare is to be 10 cents.

Evidence submitted in behalf of the company's petition estimated that 80 per cent of the passengers on the Utica lines will purchase tickets, while 20 per cent, or occasional riders, will pay the 10-cent cash fare. The commission finds that the present 7-cent fare is not compensatory and does not yield the company a fair return upon the value of the property used in giving transportation service on the Utica lines.

The order of the commission providing for the 7½-cent ticket rate and the 10-cent cash fare was unanimous. There were two opinions, one by Commissioners Pooley, Van Voorhis and Lunn, and one by Chairman Prendergast and Commissioner Van Namee.

Improvement Program Going Ahead at Richmond

Officials of the Virginia Electric & Power Company, Richmond, Va., report that the company has completed upward of two-thirds of its \$1,500,000 improvement program and are ready to rush it to completion after Sept. 1, provided the blanket franchise and bus legislation, which now are before the Richmond City Council, can be finished.

The company set aside \$500,000 for the acquisition of the bus lines of the Richmond Rapid Transit Corporation and early extensions in this service and \$1,000,000 for the co-ordinated bus and street railway improvements. The bus service was bought outright, \$220,000 more has been spent on new electric cars, \$72,000 for new buses and \$60,000 on a new garage and terminals for buses. Meanwhile, the company has kept in advance of street construction in laying new tracks.

It is stated that, under the new transportation system, every resident of Richmond will be closer than 1,320 ft. to a street car or bus line.

In reply to a question as to how long after passage of the blanket franchise and bus ordinance the entire unified system would be in operation, officials of the company stated that all of the new bus lines would be ready within approximately 120 days, and that the last of the railway extensions would be complete and in operation within eighteen months. The first of the electric extensions should be in operation within three weeks after the passage of the ordinance, it was stated.

Two hundred and thirty-seven street cars and 62 buses are in operation. Fifteen new street cars recently were added to the system on one line alone, and fifteen new buses have been ordered.

Three-Year Labor Agreement Reached in New Orleans

Union orders directing a strike of the trainmen of the New Orleans Public Service Company, New Orleans, La., effective Aug. 13 were revoked at a meeting of the union executive committee the night previous. The solution was found in a proposition whereby the union men could get their dismissal and suspension cases before members of the board of directors without having to subject the board to the necessity of sitting regularly to go through formal trials.

Here is the paragraph upon which agreement was reached:

If any employee shall have grievances or claim unjust treatment, same shall be taken up directly by the employee involved, or through representatives or committees composed of and selected by the employees for that purpose, with the division superintendents. The right of appeal to and review by the general superintendent of the department in such case shall exist from any ruling of the division superintendent and in turn to the general manager. If the decision of the general manager is unsatisfactory to the party accused, he, or the association, shall have the right of appeal to the executive committee of the board of directors of the company and upon notice of appeal the said executive committee shall sit within ten days and determine the case upon written statements. The decision of the said executive committee shall be final and conclusive.

All provisions of the contract except the dismissal feature had been agreed upon previous to the call for a strike.

Among the provisions of that agreement are:

That the contract shall be for three years.

That during that period there shall be no strike for any cause whatsoever.

That the wages of the carmen shall remain the same—that is, 45 cents an hour for the first six months; 47 cents for the next six months and then 51 cents.

That all employees in the departments concerned must become members of the union.

That the company shall not be required to discharge an employee should he be expelled from the union for any reason except for non-payment of dues.

After the new contract had been signed Rudolph Hecht, chairman of the board of directors, issued this statement:

The directors of the New Orleans Public Service Inc. are pleased that a strike has been averted and that the differences between the company and the employees have been satisfactorily adjusted. The company has consistently taken the position that matters of discipline could not in the very nature of things be the subject of arbitration. However, to avoid any misapprehension on the part of the employees and to assure them that the company and its officers and directors have every intention of giving them a square deal, it has been provided that the ultimate decision in matters of discipline will rest with the executive committee of the board of directors. To Mayor O'Keefe and the other members of the Commission Council we extend our thanks for their splendid services in bringing about the settlement.

Not by any means was agreement among the men general that a strike was advisable. As a matter of fact before the settlement was reached, St. Clair Adams, acting for some of the union men who dissented from the strike order, took additional steps intended to make the strike ineffective. First a restraining order was secured from the court prohibiting the strike call, and then a supplementary order was secured prohibiting the officers of the union from spending any union funds and prohibiting the banks in

general from paying out any of the funds of Division 194, until after a hearing on the injunction petition. This hearing was set for Aug. 16, but its need was removed by the terms of the settlement reached.

Scant Progress at Chicago

The task of solving Chicago's traction problem to the taste of the many parties involved loomed even larger last week as a result of the failure of city officials, traction executives, bankers and representatives of the Surface Lines security holders' protective committees to agree upon any definite plan.

Traction officials who appeared before the City Council committee on local transportation on Aug. 17 expressed many ideas on the subject, few of which were in actual agreement.

James M. Sheean, representing Henry M. Blair, president of the Chicago Surface Lines, as counsel, reiterated the traction chief's earlier statement that the Surface Lines will not be ready to negotiate with the city in working out the details of a new ordinance until legislation is obtained from the state removing the present 20-year franchise limitation. He said he did not think it wise for the city to negotiate a contract and then try to get the Legislature to "sign on the dotted line." In the last analysis, he added, the solution of the problem lies mainly in making traction securities attractive to investors.

In rather marked contrast to Mr. Blair's reported opinions, however, were the remarks of Leonard A. Busby, president of the Chicago City Railway, and the only company man to sit in with the Aldermen at the first traction settlement conference to which all the traction heads had been invited early in

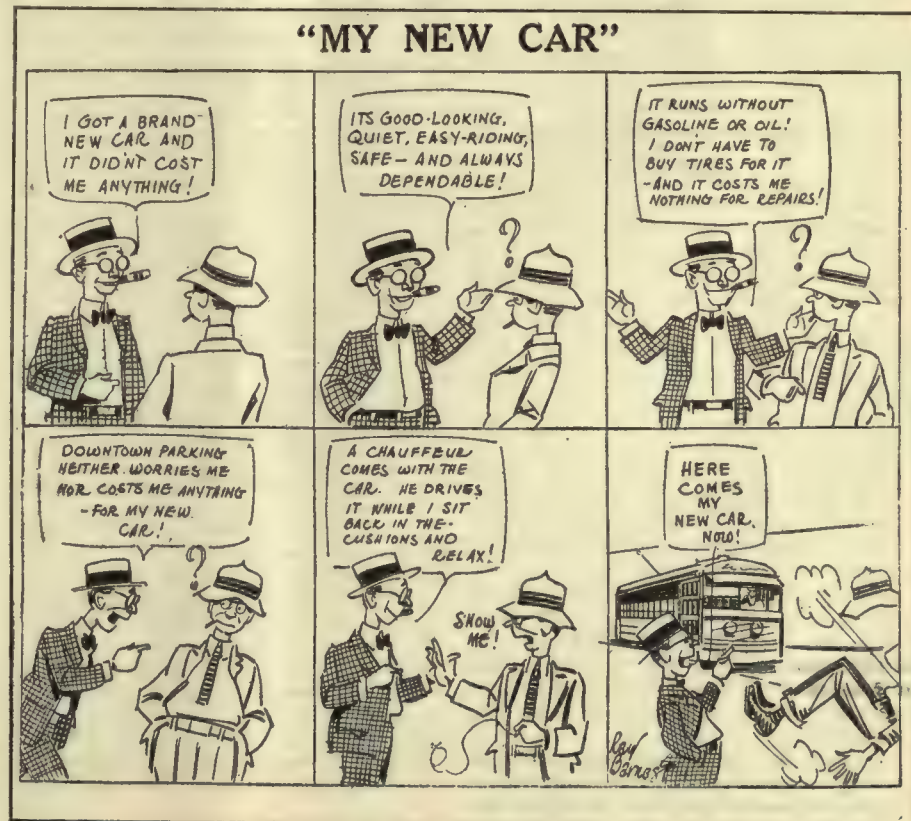
July. Mr. Busby pointed out that enabling legislation and the details of an ordinance are so inseparably bound together that it is impossible to discuss one subject without discussing the other. He agreed to co-operate with the City Council in working out the terms of a new franchise at any time.

Save for Mr. Blair, all the other officials in attendance, including Samuel Insull, chairman of the Chicago Rapid Transit Company, likewise promised to join forces with the city in attacking the baffling traction problem. Mr. Insull was doubtful, however, about the wisdom of plunging the elevated lines into the present traction ordinance discussion when they do not need a franchise. He said that under the provisions of the tentative ordinance, the elevated lines would be unable to secure capital on which to function properly.

In replying to Mayor Dever's statement that the city could not build a subway until it knew who would operate it and on what terms, Mr. Insull said that the elevated lines would "enter into any kind of an agreement by which it could pay out on the rate of fare to be charged." He was willing to enter into any arrangement to operate jointly the subway and elevated properties. If the city could agree with the Surface Lines it would not be difficult to work out an agreement with the elevated.

Cartoonist Uses Grand Rapids Cars to Point Moral

One of the most recent instances of public response to the modernization movement in Grand Rapids, Mich., is furnished by the use of the new rolling stock of the Grand Rapids Railway as the subject of the accompanying sketch "My New Car," done for the *Grand Rapids Herald* by Ray Barnes.



Ray Barnes in the *Grand Rapids Herald*

Survey of Transit at Cincinnati

The City Council of Cincinnati, Ohio, has awarded the Beeler Organization, New York, the contract to make a survey of all local transportation there and especially to report on the matter of the completion of the rapid transit project, upon which the proceeds of \$6,000,000 of city bonds have already been expended with further expenditures required to complete. Upon the information which the present investigation divulges will hinge the issue of additional bonds, estimated at \$6,000,000, by the rapid transit board. The problem is whether to abandon this plan, complete it along original lines or modify it, and if so, how. John A. Beeler, directing head of the Beeler Organization, started work at Cincinnati personally with his associates on Aug. 16.

Fast Service for Fairmont Interurban

The Monongahela West Penn Public Service Company, Fairmont, W. Va., is arranging to place in commission on its interurban line between Fairmont and Clarksburg a fast limited car, to be known as "The West Virginia," named for the State University. It will make the run between the two cities in one hour. In order that the limited may negotiate the 25 miles between Fairmont and Clarksburg, many of the usual stops will be eliminated. According to the present plan, the trains will make only four stops between the terminals of Clarksburg and Fairmont-Shinnston, Enterprise, Worthington and Monongah. In the establishment of the new service the company will not decrease the present service on the Clarksburg-Fairmont line. Trains at half hour intervals during the day and hourly intervals at night will continue to be operated. The new car is decorated in old gold and blue, the colors of the university after which it is named.

Speed Boats Suggested to Ease Traffic Jam

River transportation fed by cross-town buses is suggested as a method of transportation relief in New York during rush hours, in a report made by Major Philip Matthews, chief executive officer of the Transit Commission. The report is the result of a survey made by the commission during the recent Interborough subway strike.

Major Matthews suggests that high-powered boats be used to transport passengers up and down the North River with bus lines feeding the boats at such points as 125th, 96th, 42d and Rector Streets, with a possible stop at or near Fourteenth Street.

There is a possibility that if co-operation can be arranged with those who obtain bus franchises, similar service might be introduced on the East River, and fast boats operating as part of bus systems might be run between Manhattan and Brooklyn and Manhattan and Queens. Docking privileges would be obtained from the city if the plan was made effective. It is the sug-

gestion that the extraordinary service be used only in rush hours and the boats be put to some other use at other times.

Wage Arbitration Case on Eastern Massachusetts Closed

The arbitration hearings on a new wage scale for the employees of Eastern Massachusetts Street Railway, Boston, Mass., are ended, and the closing argument has been held. The case is now before the special board of arbitration for its decision.

City Rejects Long Island Road's Offer

Chairman John H. Delaney of the Board of Transportation of New York City has informed the Long Island Railroad an offer it had made to cede its franchise for the Whitestone Landing branch was not acceptable. The company recently offered to surrender its right of way at a great saving both to the city and the railroad.

In his offer George Le Boutillier, vice-president of the railroad, said the company could not afford to eliminate the grade crossings as required under the law and that it was willing to abandon the line. He estimated the saving to the city would be \$1,000,000 and to the company \$2,000,000. The letter said the line would become obsolete when the city had completed its rapid transit program and suggested it might be made a part of the subway extension if ceded to the city.

Mr. Delaney says that the city's financial resources will be strained to the limit for the next eight years to provide funds for the financing of the \$600,000,000 trunk subway program already laid out, and not one cent will be diverted for the extension of existing subways.

Cinderella Holds Up Traffic

The United Railways & Electric Company, Baltimore, turned to good account a little item that appeared in the Baltimore *American* recently.

"What's a traffic jam compared to a pair of light green satin slippers that just match one's latest frock? Bah! Don't mention 'em in the same breath!" said the newspaper story. "Which, there is little doubt, was the line or reasoning employed by a pretty Baltimore maiden yesterday afternoon in West Lexington Street. She left her roadster in the middle of the thoroughfare, tripped into a store and came forth with the slippers. There was a traffic jam three blocks long."

In reprinting the story the United also presents the following editor's note: "The 'amazing' thing about this tale is that she didn't repeat this performance at eight different stores and wind up by buying a new hairnet instead of slippers. The moral is, shop for your green satin slippers by street car."

Seattle Railway Leased by Theater

For one hour on Friday night, Sept. 10, every resident of Seattle, Wash., who so desires will be permitted to ride free on the municipal street cars to the downtown sections of the city. Under an agreement sanctioned by the City Council, D. W. Henderson, superintendent, has been authorized to lease the 197 cars between the hours of 6:30 to 7:30 p.m. that day to the Fifth Avenue Theatre Company, at a cost of \$669.80.

The renting company will open its theatre on that night. It will also carry as its guests all inbound passengers on municipal street cars, and Mr. Henderson has declared that he will have rolling stock available to transport every person in the city from home to downtown that night during the one hour of free rides. Mr. Henderson explained to the Council that inbound traffic between 6:30 and 7:30 nightly was at its lowest ebb, that the leasing of the cars would cause no operating loss to the service, and that it would tend to encourage people to use the cars.

Hope for Agreement in Control of California Line

For the coming fruit shipping season, the Central California Traction Company, San Francisco, Cal., will be operated as an independent railroad, and the section between Sacramento and Stockton will be open freight soliciting territory as far as the Santa Fé, the Southern Pacific and the Western Pacific are concerned. This is the result of the third postponement of the date for filing exceptions to the examiner's report which has been granted by the Interstate Commerce Commission in order to give the three railroads concerned time to agree upon a plan whereby the traction company can be operated under joint management. The date now set is Dec. 1. Note of the opinion of R. R. Holster, Interstate Commerce Commission examiner, was made in the *ELECTRIC RAILWAY JOURNAL* of March 29. All three of the transcontinental railroads have offered to buy the traction line, but in each case the examiner has decided that such an arrangement would not be in the public interest.

One-Man Cars on 32-Mile Run

What is said to be the longest one-man car route in Ohio is being operated by the Stark Electric Railroad between Canton and Salem, a distance of about 32 miles.

To reduce the operating cost of the interurban line, the Stark Electric has placed eight new one-man cars in service over the route on a half-hour service.

To protect cars at three grade crossings, the company has employed its own watchmen. With two shifts at each crossing, the company employs six men to replace from 16 to 24 men.

On the old basis with two-man cars eight cars were in constant operation. This required 32 men for two shifts with additional men for the night runs.

Draft of New Toledo Grant Being Completed

Aug. 23 is the date that has been fixed for the presentation to the City Council of Toledo, Ohio, of the new franchise ordinance for the Community Traction Company. If the ordinance is passed it will be placed before the voters in November. Into the ordinance will be inserted an amendment to the city charter which will permit a monopoly of local transportation by the railway. Voters will cast their ballots for both the amendment and the new ordinance on one ballot.

The draft of the new ordinance is now being completed. Naturally there are many rumors as to its terms. It is said that a maximum fare of 10 cents and a complete monopoly to the Community Traction Company will be provided. Under the new ordinance the Street Railway Board of Control will have practically complete control. A drastic forfeiture clause will be included in the new ordinance to protect car riders. This clause, it was announced, will force the operating company to maintain adequate service at a reasonable cost.

The board of control will be tested with power to raise or lower fares as it sees fit to encourage street car riding. The new ordinance practically breaks away from the old flexible fare rate which provided that fares increase as street car riding decreases.

The street railway commissioner will act as an executive officer of the board of control under a new ordinance.

The city will pay for paving and repaving of streets between the street car tracks but the forfeiture clause will include a provision requiring the company to maintain this pavement.

The new ordinance is being drafted along lines suggested in a transportation survey made by Prof. H. E. Riggs of Ann Arbor.

Terminal Electrification Discussed in Chicago

Electrification of Chicago's steam railroad terminals would be an immense civic improvement, but it cannot be accomplished until the railroads are convinced that a fair return is possible on the tremendous investment that would be necessary to carry out the work. This, in brief, was the conclusion reached by the subcommittee of the City Council at the end of its series of conferences with railroad executives, real estate operators and engineering experts on July 25.

Mayor Dever declared that the health of Chicago's citizens must be protected against smoke and dirt. He cited the example of New York, and also that of the Illinois Central Railroad, which recently electrified its suburban divisions out of Chicago, as proof that electrification is possible.

Joseph K. Brittain, president of the Chicago Real Estate Board, declared that speedier transportation is an immediate necessity. He said that he believed the benefit to community real-estate values would easily equal, if not exceed, the immense cost of electrification of lines serving it. This opinion

was concurred in by F. L. Thompson, vice-president of the Illinois Central, who told the Aldermen that his company expected to make its suburban service pay for the first time by virtue of increased business attracted by recent electrification.

William R. Dawes, president of the Chicago Association of Commerce, was less encouraging. He declared that Chicago business men were not in favor of electrification, because they realized that the railroads must inevitably increase their freight rates in order to retrench themselves for the enormous outlay necessary. Charles Dillon, editor of the *Railway Review*, was of much the same opinion. He stated that many railroads entering Chicago were small and financially weak and that, for them, electrification was absolutely impossible.

The testimony of various officials of several of the larger railroads was substantially the same. They declared themselves to be in hearty sympathy with the aspirations of the committee, but feared that electrification would be gradual at best. They all agreed that the railroads could not consider the question seriously until it was demonstrated that they could secure a fair return on their investment.



News Notes

New Development in the Ironwood Street Car Controversy.—The Ironwood Commercial Association has endorsed the proposal that the city commission join with the Lake Superior District Power Company, Ashland, Wis., in submitting the matter of increased fares and paving relief to the Michigan Public Utilities Commission. This marks the latest developments in the Ironwood street railway abandonment controversy. Members of the association looked upon the proposed loss of railway service as a grave injury to the future growth and prosperity of Ironwood.

Paving Controversy Holds Up Abandonment.—Action by the City Council on the request of the Lincoln Traction Company, Lincoln, Neb., for permission to take up its South Fourteenth Street track as soon as bus service to the State Penitentiary can be established and routed largely by way of Thirteenth, has been halted by the insistence of property owners that the company make some contribution toward the paving of that part of South Fourteenth Street which is unpaved and where the tracks now rest. The company protests against paying for paving where it will have no tracks in the future, but the property owners insist they would not have signed for paving if they had known the company would, by withdrawing car service from the street, avoid any liability for paving costs and thrust the additional burden upon their shoulders. The Council is seeking a way to pave without increasing the proportion that it was intended originally the property owners were to pay.

Seattle's Transportation Problems Discussed.—Prominent business men and civic leaders of Seattle recently organized themselves into the Seattle Rapid Transit Club to conduct a campaign for better transportation. At their meeting one of the number expressed the opinion that Seattle's progress will be seriously retarded unless rapid transit is installed to afford traffic relief; that records of large Eastern cities having rapid transit show a steady and rapid growth; and that a project under which Seattle will be furnished with local transportation more commodious than is possible by surface car is the only permanent solution of Seattle's traffic problems.

Increase for Washington Trainmen.—Trainmen in both passenger and freight service of the Seattle & Rainier Valley Railway, Seattle, Wash., have been awarded an increase in wages of 2 cents an hour effective Aug. 1, by a board of arbitration. The increase will not apply to present line bus operators.

Street Railway Improvement for Wisconsin.—Improvement of the railway system operated by the Wisconsin Gas & Electric Company, Kenosha, Wis., to include the extension of one line, building of two single track lines and the double tracking of three lines with a view to increasing transportation facilities and relieving traffic congestion in the downtown district, was practically assured when the City Council indorsed extensions to the railway franchise bearing on these proposed improvements.

New Franchise for Ohio Line.—The Western Ohio Railroad, Lima, Ohio, has been granted a new franchise by the City Council of Sidney, Ohio. The present franchise expires on Nov. 1 and the new one will extend for a period of twenty years.

Will Use Buses on Part of Line.—The Rockford City Traction Company, Rockford, Ill., has been ordered to remove its tracks on South Main Street from West State to Morgan Streets, and to operate buses instead of cars. The order was made by the City Council at a stormy session attended by a large number of protesting South Rockford residents. An assessment of \$25,000 has been ordered against the traction line to pay for the replacement of paving between the car tracks and an annual license fee of \$50 has been fixed for each bus now operated or to be operated in the future by the company.

Railroad Reduces Fares in New York Suburbs.—Although the village trustees of Mamaroneck recently authorized the New York & Stamford Railroad, Port Chester, N. Y., to operate under an old fare schedule which places the fare from Mamaroneck to Larchmont at 14 cents, it is learned that the railroad plans to collect only a 10-cent fare during September. This action is construed by village residents to mean that the railways will compete, at least in fare, with any bus lines that start between the villages. Several propositions have been made to the officials of towns between Port Chester and Larchmont, but no company has yet received the support of all communities.

Recent Bus Developments

Bus Rumors Revived in Westchester

Officials of the Third Avenue Railway, New York, are understood to have been in conference with bus owners at White Plains in an effort to establish the nucleus of a proposed county-wide bus system. The firm of Brennan Brothers and the Soundview Transportation Company, are said to have received offers for their lines.

S. W. Huff, president of the Third Avenue Company, which through a subsidiary, the Union Railroad, recently purchased the Westchester Street Railroad at auction, said at a conference with officials of White Plains that his company planned to run trolley cars until it was proved that buses would be better.

The Yonkers-Rye Beach bus system is operated through White Plains by the Third Avenue Company, which also has a bus route to Harrison from White Plains. Buses have replaced the trolleys in a section of East Chester. The trolley line abandoned was another subsidiary of the Third Avenue Company, the Westchester Electric Railway holding the only franchise for the operation of vehicular transportation between White Plains and Mamaroneck. The route from the city line to the center of the village of Mamaroneck has been suspended for several years, but the Third Avenue Company is attempting to install a bus service along the Sound shore. The company most favored is the County Transportation Company, a subsidiary of the New York, Westchester & Boston Railroad, which operates to Mamaroneck and is extending its line to Harrison.

In Yonkers the efforts of the city to sell at public auction franchises for the operation of fifteen bus routes is being opposed by the Third Avenue Company, which operates both trolleys and buses there.

In Larchmont the Village Board on Aug. 10 voted unanimously in favor of granting to the County Transportation Company, a franchise to operate a bus line within the village limits. It is the purpose of the company to establish a line of buses to connect Port Chester, Rye, Harrison, Mamaroneck and Larchmont. The company has received a permit to operate in Harrison, and it is understood that franchises will be granted in Port Chester and Rye.

Change of Plan Causes Delay for Nebraska Interurban

The State Railway Commission has declined to approve the application of the Omaha, Lincoln & Beatrice Railway to supplement interurban service by bus service between Lincoln and University Place, a suburb 5 miles distant, until such time as the Lincoln Traction Company has had an opportunity to examine the situation and enter a protest if it chooses to do so.

The commission so ruled after the interurban had amended its original application, in response to letters and requests from business interests, so as to run the buses through the retail district, now served by the Lincoln Traction Company, the territory of which the interurban has hitherto carefully refrained from invading. The Councils of both Lincoln and University Place approved the supplemental service. The company's original plan was outlined in the *ELECTRIC RAILWAY JOURNAL* in the issue of July 14.

Construction of Bus Terminal Delayed

The project of the Pacific Northwest Traction Company, Seattle, Wash., which provides for construction of a \$500,000 interurban and bus terminal, faces another thirty days delay, as the City Council has recently returned the entire matter to the committees on franchises and streets and sewers for further consideration. Property owners in the district have protested the construction.

Bus Service Expanded at Olean

Buses replaced trolley cars in the territory served by the line of the Olean, Bradford & Salamanca Railway Company, Olean, N. Y., between Olean and Salamanca, on Aug. 14, except for two runs daily. The change is in the nature of an experiment, which will be continued for an undetermined time. Should the change prove successful, the bus service will be made permanent. Buses have been used on the run between Olean and Bradford some time. The night bus leaving Salamanca for Little Valley at 9:30 has been discontinued. The last bus for Little Valley now leaves at 3:05. The revenue received did not warrant the 9:30 bus.

Bus Lines in Kansas City Rerouted

Temporary changes in the routings of the 39th Street crosstown and the Country Club express bus lines in Kansas City, Mo., have been granted by the city with the understanding that if the changes do not prove beneficial after a trial of ninety days, the lines are to be returned to their former routings.

The western terminus of the 39th Street line will be moved from 47th and Mill Creek Parkway to 48th Street and Bellevue Avenue to the following route:

From 47th and Mill Creek Parkway, west in 47th Street to Roanoke Boulevard, thence south to 48th Street; West in 48th Street to Bellevue Avenue; north in Bellevue Avenue to 47th thence east to present terminus at 47th and Mill Creek.

This change extends the line to an apartment district not served before.

The change in the Country Club express route is not an extension. It will be between the intersection of Wornall road and Alameda road and the intersection of Alameda road and Wornall road by way of 47th Street. Thus the express line will be made more convenient to residents in the vicinity of Country Club Plaza.

Railways Plan Greater Use of Buses

Two interurban railways operating out of the city of Tulsa, Okla., plan greater use of buses in carrying passengers. The Union Transportation Company, which handles bus business of the Oklahoma Union Railway, Tulsa, Okla., has been authorized by the Corporation Commission to operate buses from Tulsa to Mounds via Sapulpa and Kiefer with the restriction that passengers are not to be carried by bus between Tulsa and Sapulpa. The company will continue to carry passengers over its interurban line from Tulsa to Sapulpa. The service from Sapulpa to Mounds, the southern terminus of its interurban line, and from there into Okmulgee and Henryetta will be handled entirely by buses. The railway line, however, will be maintained to handle freight service.

The Sand Springs Railway, Tulsa, Okla., operating an interurban line from Tulsa to Sand Springs, has notified city officials at Tulsa of its intention to apply to the State Corporation Commission for a permit to operate a bus line parallel to its interurban line. Officials of the company state that this does not mean that the interurban line will be abandoned, but that supplemental service will be given.

Wind-Kissed Cheeks of Apollos and Aphrodites of West

Alabaster Apollos who crave a golf course tan without the exercise are riding the bus tops in Kansas City these days. There is plenty of proof of this, according to officials of the Kansas City Railways, Kansas City, Mo., who announce that the receipts of the lines on which the double-deckers are run have greatly increased in the last two months. Likewise athletic Aphrodites who disdain the lemon and sunbonnet are getting their sunlight and wind that way. It makes one look and feel like the sipper in the soft drink ads. Palm Beach, ahoy!

The "toppers" are now in their heyday on the double-deck lines. Coatless, hatless, they gulp the sun swept winds as the city comes rolling up. The results are the same as might be secured at the seashore and they can be obtained going to and from work.

During the rush hours the buses, of course, are filled to capacity, but in the off periods riding on the double deckers is confined almost entirely to the upper deck.

With the arrival of hot weather the interiors of the single-deck buses were uncomfortable as the four ventilators, designed to carry the air in and out, were not of capacity sufficient to the needs. To remedy this condition cast-

ings prepared in the company shops were fitted to the buses so as to allow the opening of the front windshield and permit the air to sweep through the buses. This proved so satisfactory that the patrons of the single-deck vehicles have ceased to envy their friends who use the lines on which the double-deckers are run.

Bus Franchise Report Not Ready for New York Board

Owing to the failure of the Board of Transportation of New York City to have the analysis on the bus franchise applications ready, no meeting of the Board of Estimate was held on Aug. 19. The date of the next meeting is contingent upon the receipt of the report by Mayor Walker. Four days after he receives it the meeting will be held, to allow members of the board now on vacations time to get to the meeting.

Bus Service for Scranton Discussed.—The Scranton Railway, Scranton, Pa., is asking the Public Service Commission for certificates of convenience to run bus lines on Green Ridge Street from Dunmore to Providence and also from Throop directly into the center of the city. A hearing at which the city was represented was held recently at Harrisburg.

Loss on Line Company Seeks to Abandon.—According to the petition of the Interstate Public Service Company, Indianapolis, Ind., to abandon its bus service between Franklin and Columbus, Ind., between Seymour, Ind., and the Indiana-Kentucky state line and its through service between Indianapolis and Louisville, the loss during the first six months of this year on the Indianapolis-Louisville service was \$10,494. Receipts were only \$4,350, compared with operating costs of \$14,844. On the Indianapolis-Seymour bus line during the first ten days of July the company transported only 49 passengers with a total revenue of \$43.05. Mention of the company's intention to abandon these lines was made in the *ELECTRIC RAILWAY JOURNAL* of Aug. 7.

Adequacy of Five-Cent Bus Fare Discussed.—From the point of view of Mayor C. M. Blanc of St. Petersburg, Fla., the fares on the newly established municipal buses should be fixed at 5 cents, at least during the summer, in order to induce the citizens to use them. Other officials point out, however, that tests elsewhere have established 10 cents as the minimum fare at which buses can be operated successfully under average conditions. It is hoped that the bus lines eventually will pay their own way, but at present any deficit in their maintenance will be met from the profits of the electric railways, which are said to be paying steadily.

Buses Will Supply Service.—The City Council of Canton, Ohio, has permitted the Northern Ohio Power & Light Company to abandon one of its city lines extending from Market Street over Sixth Street, Ninth Street and Maryland Avenue, a distance of nearly 2 miles. Bus service will be substituted. The line has been operated at a loss for

a long time due to the closing down of industrial institutions.

Applies for Bus Line in Troy.—The Capitol District Transportation Company, Inc., a subsidiary of the United Traction Company, Albany, N. Y., filed a petition with the Public Service Commission for a certificate for the operation of a bus line from the Troy City line in Pawling Avenue, along Pawling Avenue to Congress to Fourth to Fulton to Third to Congress to Fourth Street, the city authorities having granted the company a consent for such operation.

Bus Service Extended in Illinois.—The Red Line Motor Bus Company has been granted permission by the Illinois Commerce Commission to extend its service from Greenville to Vandalia, Ill. This company originally started with a line between Collinsville and Troy, Ill. Later it extended to Greenville and when control passed to the East St. Louis & Suburban Railway, East St. Louis, Ill., the buses were run into St. Louis, Mo. The State Commission has authorized the Tri-City Service Company to extend its service from Vandalia to Effingham, Ill.

Tulsa Chamber Approves Anti-Jitney Ordinance.—The directors of the Tulsa Chamber of Commerce have expressed unqualified approval of Tulsa's present bus service system as operated by the Union Transportation Company and have condemned the old seven-passenger jitneys which were formerly operated on the streets of Tulsa by several different concerns. The resolution was occasioned by efforts of jitney owners to regain use of the streets of Tulsa through a suit in the district court. The city commissioners of Tulsa recently adopted a stringent ordinance regulating the capacity and equipment of city transport carriers and which was intended to keep jitneys off the streets.

California Company Changes Bus Route.—The Pacific Electric Railway, Los Angeles, Cal., has been authorized by the Railroad Commission to change its motor bus route between Pasadena and Shoen. The rerouting was desired by the city of Pasadena to relieve traffic congestion on Colorado Street and Raymond Avenue, and to eliminate five safety stops in the cities of South Pasadena and Alhambra and avoid a highway not well paved.

Buses Start New Service in Minnesota.—Permission has been granted by the City Council of Superior, Minn., to the Superior-Duluth Coach Company, a subsidiary of the Duluth Street Railway, Duluth, Minn., to operate a city bus service on the streets of Superior. The company will begin service with four buses.

Co-operation Between Ohio Car and Bus Lines.—Through an agreement, effective Aug. 1, signed between the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, and the Springfield, Urbana & Piqua Bus Company the buses of the latter company will use the traction stations as terminals in Springfield and Urbana. Schedules of the buses will be changed so that direct connection will be made with the traction company's cars and buses to Columbus and Dayton.

Buses Replace Street Cars in Belleville.—Buses replaced the local street cars of the East St. Louis & Suburban Railway, East St. Louis, Ill., in Belleville after months of discussion and negotiation with the city officials. These new bus lines cover approximately 60 per cent more territory than the street car lines, and the change has greatly improved the local transportation facilities, putting the city of Belleville on a par with any other of similar size in the United States. In July, 1924, the Oakland street car line was abandoned and a bus run in its place. The route covered by the bus was approximately 50 per cent greater than that covered by the street car. The success of the Oakland bus line led the company to ask the city officials for permission to replace the other street car lines with buses.

More Bus Lines for Cleveland.—Two new bus lines in Cleveland, Ohio, one on Eddy Road from Euclid Avenue to Lake Shore Boulevard, and the other on Bartlett Avenue from East 131st Street, to Gay Avenue, and thence to East 129th Street to Corlett Avenue probably will be placed in operation by the Cleveland Railway within the next few weeks.

Express Bus Service in Ohio.—The Northern Ohio Traction & Light Company, Akron, Ohio, established express bus service at a 10-cent fare on the through city streets of Akron on Aug. 4. Service is being well patronized. Buses from the Six-Wheel Company, Philadelphia, are being used. The single-deck bodies were built by Kuhlman, Cleveland. The double-deck bodies were built by Hoover Company, York, Pa.

Buses Operate in Westfield.—Bus service was started in Westfield on Aug. 1 by the Springfield Street Railway, Springfield, Mass. The trolley service has been abandoned, with the exception of the line running from Springfield to Westfield and the short line in Westfield proper. The fare has not been changed under the new régime.

Buses to Replace Logan Street Railway.—Replacement of the railway system in Logan, Utah, with a fleet of buses is asked by the Utah-Idaho Central Railroad, Ogden, Utah, in a petition submitted to the Public Utilities Commission. The petition states that the street car line has lost money for several years and that with bus service the company will be able to cover a wider area in the city and give better service than does present electrically operated railway. The company proposes to charge a 7-cent fare on the buses, offering three fares for 20 cents and twenty school tickets for \$1. While no mention is made in the petition regarding the disposition of the railroad trackage, it is understood that it will be removed.

Buses Begin New Service in Pennsylvania.—The Northern Cambria Street Railway, Patton, Pa., has abandoned traffic over its railway lines, and substituted service with three buses. The buses will operate from Barnesboro to Spangler, Bakerton and Carrolltown with probable extensions of the lines to nearby towns. The last trolley was run over the 8-mile route on July 31.

Financial and Corporate

New Company to Take Cuban Railways

A new company called the Havana Electric Railway is to be incorporated under the laws of Maine, preliminary to carrying into effect the program of the Havana Electric Railway, Light & Power Company to segregate its railways from its light and power properties. This new Havana Electric Railway will acquire all of the railways now owned by the Havana Electric Railway, Light & Power Company and by the Camaguey Electric Company and by the Santiago Electric Light & Traction Company.

The Havana Electric & Utilities Company, which is controlled by the Electric Bond & Share Company, will have a substantial interest in the common stock of the new company and will be represented on its board of directors.

Frank Steinhart, who for about twenty years has successfully operated the properties of the Havana Electric Railway, Light & Power Company, will become president of the new company. Mr. Steinhart says that the segregation of the railways from the light and power properties would benefit both divisions. In none of the twenty years of operation, he said, had the railway business of Havana failed to show a substantial profit and an appreciable part of the improvements to the light and power plants had been financed out of the surplus profits resulting from railway operations. Bearing in mind the future development and expected growth of the railway and power properties, he had reached the conclusion that their financial requirements could better be met if the two divisions were organized as separate units.

Provision will be made for the release of property under and satisfaction of some of the underlying mortgages. The securities of the new company, consisting of \$5,500,000 of 5½ per cent gold debentures bearing subscription warrants for common stock, and \$5,000,000 of 6 per cent cumulative preferred stock carrying a bonus of common stock, have been purchased by Speyer & Company and J. & W. Seligman & Company, and will shortly be offered for public subscription.

Lines of the system in 1925 carried approximately 136,000,000 passengers. Gross revenues for 1925 were more than \$6,960,000 and net earnings, after operating expenses, maintenance and taxes, were more than \$1,880,000.

In accordance with the new plan Speyer & Company in conjunction with J. & W. Seligman & Company, Hemphill, Noyes & Company, and Otis & Company, offered for sale on Aug. 16 \$5,500,000 Havana Electric Railway twenty-five year 5½ per cent gold debentures (each debenture accompanied by a twenty-five year warrant entitling the holder to subscribe to 23 shares of common stock at \$45 a share). The

offering price was 92, at which price the debentures yield more than 6½ per cent. This issue was followed by formal offering later in the week by the same group of \$5,000,000 Havana Electric Railway 6 per cent cumulative preferred stock. This stock was offered by the bankers at \$100 a share with a bonus of six-tenths of a share of common stock.

\$5,000,000 More P.R.T. Stock for Sale to Riders

The City Council has been requested by the Philadelphia Rapid Transit Company, Philadelphia, Pa., to assent to the issuance of \$5,000,000 of 7 per cent preferred stock, \$50 par, retireable upon any dividend date at \$55 a share and accumulated dividends.

This stock will be sold direct to car riders, in accordance with Mitten Management policy of having P. R. T. customers—the riding public—share in the ownership of the company which supplies them service. To this end P.R.T. common stockholders have been requested to waive their rights of subscription.

About \$1,550,000 of this new preferred stock will go toward the retirement of underlying securities, including P.R.T. bonds and car trust certificates and similar securities of P.R.T. underlying companies.

About \$1,700,000 will be used for normal capital expenditures for track improvements and extensions; improvements and additions to carhouses, substations, transmission and distribution system, etc.

About \$1,750,000 is required for additional buses to add to the extensive system which P.R.T. has given to Philadelphia in the past two years, with necessary service equipment and garaging.

P.R.T., in the spring of 1925, started its car-rider ownership policy with the sale of \$3,000,000 of its 7 per cent preferred stock. This first issue was sold on the cars in small lots and by such easy payments that the car rider of the most modest means had opportunity to invest in the securities of the company.

In the spring of 1926 authorization was secured from City Council for the issuance of \$15,000,000 additional; \$5,000,000 of this issue was held pending approval by the Public Service Commission of the purchase by P.R.T. of the Yellow Cab Company and the other \$10,000,000 was sold to the car riders under terms similar to those under which the \$3,000,000 had been sold a year earlier. This \$10,000,000 issue was over-subscribed by the car riders in ten days.

The increase of \$5,000,000 now requested, together with the \$5,000,000 covering the Yellow Cab purchase, will be put on sale, when properly approved, in the fall of 1926.

Four Massachusetts Roads Make Legal List

The Public Utilities Department of Massachusetts has certified to the Bank Commissioners that four electric railways holding Massachusetts charters have earned and properly paid, without impairment of assets or capital stock an amount in dividend equal to 5 per cent on all outstanding stock, for a period of at least five successive years. Because of this certification their securities are legal investment for the savings banks, under Massachusetts law. The companies so certified are the Boston Elevated Railway, the Boston & Revere Electric Street Railway, the Holyoke Street Railway and the Union Street Railway, New Bedford. They are the only railways in Massachusetts that have met these dividend requirements this year.

Some serial bonds of the Eastern Massachusetts Street Railway come within the same classification, of legal savings bank investment, under special legislation and an agreement with the road's board of trustees.

Merger Hearing Set for Aug. 24

The New York Transit Commission announced on Aug. 18 that it would hold a hearing Aug. 24, on the application of the Fifth Avenue Coach Company for permission to acquire all the common stock of the New York Railways. A total of 900,200 shares, all the common stock of the company, is involved.

That such an application would be made was announced last May when it became known an agreement had been reached for a merger of the companies. The coach company has submitted bus bids and the New York Omnibus Corporation, which represents both interests, has a bid waiting consideration.

The proposal of the New York City Omnibus Corporation was to operate buses north and south in Manhattan for a 10-cent fare, with cross-town lines operating at a 5-cent fare. It was planned originally if the franchises were granted to eliminate 25 miles of surface car lines, supplanting the cars with buses.

Reorganization of Dayton-Springfield Arranged

Plans have been completed for the reorganization of the Dayton Springfield & Xenia Southern Railway, Dayton, Ohio. The property of the company operating under this name was sold on July 22 at Xenia to C. J. Ferneding, president, for \$130,000.

Since then the Public Utilities Commission of Ohio has authorized the Dayton-Xenia Railway, the successor company, to issue 3,500 shares of no par value common stock, \$250,000 of 5 per cent preferred stock and \$250,000 of 6 per cent first mortgage gold bonds. The new securities take the place of \$394,000 bonds, \$298,000 of preferred stock and \$200,000 of common stock of the old company.

The Dayton, Springfield & Xenia Southern Railway was incorporated under the laws of Ohio as a successor

to the Dayton-Xenia Traction Company, the property of which was sold under foreclosure in June, 1909. This last-named company was a consolidation of the Dayton & Xenia Traction Company, Dayton, Spring Valley & Wilmington Transit Company and the Rapid Transit Company of Xenia. The road extends from Dayton to Xenia 20.65 miles. Power is purchased from the Dayton Power & Light Company. The last report available in the financial manuals, namely, that for the year ended Dec. 31, 1924, showed gross earnings of \$243,803 with a net income of \$22,595 and a surplus of \$1,063 after the payment of fixed charges.

Part of Nebraska Road Being Dismantled

Acting under permission from the Nebraska State Railway Commission the Omaha & Lincoln Railway & Light Company, is taking up its tracks between Papillion and Ralston. This interurban was intended to connect the cities of Lincoln and Omaha. It was started in 1911, but never got beyond Papillion. Ralston is a manufacturing suburb of Omaha, and is still served by the company, but with only two cars a day. Bus service was tried between Ralston and Omaha by the interests that run the railway, and proved a success. It is now being extended to Papillion. The company sells a considerable amount of current, but the road between Papillion and Ralston has never been profitable.

Washington-Virginia Railway May Be Sold to Local People

The Washington-Virginia, once one of the famous electric railways of the country, operating 60 miles of track connecting Washington, Alexandria and Mount Vernon, and Washington, Arlington and Fairfax faces abandonment. The company recently announced that the earnings were insufficient and that there were many difficulties surrounding the situation. Therefore the various bondholders' protective committees decided to shut down unless the local communities served were sufficiently concerned in maintaining the service to raise the necessary new capital. Interested bodies in Alexandria and neighboring communities are trying to find ways and means of purchasing all or part of this company's property at a fraction of its original cost.

The Washington-Virginia's difficulties are due principally to the fact that the Virginia Public Service Commission granted certificates to independent bus operators despite the willingness of the company to furnish this service, to the unregulated interstate bus competition, to difficulty in obtaining fare adjustment on account of being subject to the Interstate Commerce Commission, Virginia and District of Columbia Commissions, and finally to expensive maintenance in the District, where the underground electric system is in use.

As noted in the ELECTRIC RAILWAY JOURNAL for Aug. 7, the company has given the local communities a reason-

able time to devise some plan by which the operation can be continued before it proceeds to scrap the system.

\$118,199 Increase in West Penn Net Income

A comparative statement of the consolidated income account of the West Penn Railways, Pittsburgh, Pa., excluding inter-company items, for the years ended Dec. 31, 1925 and 1924 follows:

STATEMENT OF WEST PENN RAILWAYS EARNINGS		
	Year Ended Dec. 31, 1925	Year Ended Dec. 31, 1924
Gross earnings, from all sources.....	\$20,206,221	\$20,073,164
Operating expenses, including maintenance, taxes and rentals.....	11,169,278	11,634,521
	\$9,036,942	\$8,438,643
Deductions:		
Interest and amortization.....	3,375,715	3,243,852
Preferred dividends of subsidiary.....	909,195	740,100
Income applicable to minority interest.....	587,889	505,182
Total deductions.....	\$4,872,800	\$4,489,135
Net income before renewals, replacements and depletion.....	4,164,141	3,949,508
Reserved for renewals, replacements and depletion.....	1,665,778	1,569,343
Net income.....	\$2,498,363	\$2,380,164
Dividends on preferred stock.....	\$209,981	\$383,579

The company explains that it has continued its policy of raising the standard and safety of the service. The year's operations were conducted in a most satisfactory manner and without serious accident or injury to passengers.

Through freight service over lines of Pittsburgh Railways and West Penn Railways, between the city of Pittsburgh and Coke Region points, started in August, 1924, has been substantially developed and the income arising therefrom very greatly increased during the year.

Sunday passes were adopted for use on long interurban lines with encouraging results and this means of stimulating holiday travel has been placed on a permanent basis and will be extended to other parts of the system. Weekly passes have also been put into effect with very satisfactory results.

The general tendency of the public to relieve street railways from the obligation to renew paving required by old and obsolete franchises has resulted in the company's obtaining new franchises without such obligations in several of the boroughs and towns through which it operates.

Further revisions in the company's rates of fare have been accomplished during the year and economies in trans-

portation expense through the operation of one-man cars and other improvements have resulted in lessening the cost of operation. To relieve traffic congestion in some of the larger cities, loop operation has been adopted and construction of additional passenger and freight terminals with loop facilities in others are now in contemplation.

Chester Dale, New York City, was elected a member of the board of directors to fill the vacancy caused by the resignation of William B. Schiller.

Mitten Bank Opened in Philadelphia

Mitten Men and Management Bank & Trust Company, which took over the bankrupt Producers and Consumers Bank, Philadelphia, Pa., opened for business on July 1 in the building occupied by the defunct company, 927 Chestnut Street. The new bank starts with \$1,000,000 of capital, surplus and undivided profits. A branch bank operated by the P.R.T. Securities Corporation, at 235 South Broad Street, the company announces, will accept deposits for the new bank.

Thomas E. Mitten, chairman of the P.R.T. board of directors, is active head of the bank. His son, Dr. A. A. Mitten, also a member of the P.R.T. board, is vice-president. Half of the bank stock is owned by transit employees, who have representatives on the board. This is in accordance with the Mitten plan for the further democratization of the ownership of industry.

As announced when the Mitten offer was under consideration by the court, depositors and stockholders of the bankrupt institution will be credited with the profits of the new bank until their losses are made up, a procedure which has caused much favorable comment.

CONSOLIDATED INCOME ACCOUNT OF WEST PENN RAILWAYS AND SUBSIDIARIES FOR YEAR ENDED DEC. 31, 1925

Gross operating earnings.....		\$18,670,411
Operating expenses and maintenance (including \$1,665,778 reserved for renewals, replacements and depletion).....	\$11,810,529	
Taxes (including Federal).....	1,016,751	12,827,280
		\$5,843,131
Miscellaneous income.....		1,535,809
		\$7,378,940
Interest on funded debt.....	\$3,335,418	
Interest on floating debt.....	125,641	
Amortization of discount.....	222,216	
	\$3,683,276	
Less proportion charged to improvement accounts.....	307,561	\$3,375,715
Rentals.....		7,776
Dividend accrued on preferred stock of West Penn Power Company in possession of public.....	909,195	
Income applicable to common stock of West Penn Power Company owned by The West Penn Company.....	587,889	4,880,576
Net income.....		\$2,498,363

Reasons for Short Albany Abandonments Reviewed

Approval was sought by the United Traction Company, Albany, N. Y., on July 14 from the Public Service Commission of three petitions seeking abandonment of portions of its route in the cities of Albany and Rensselaer.

The Albany petition sets forth the desire of the company to abandon that portion of its road upon South Ferry Street. This is a single track about 1,484 ft. in length that serves no useful purpose, there being no present operation of cars by the traction company.

Two of the petitions filed relate to proposed abandonments in the city of Rensselaer, one of which covers the portion of the route of the company located on Broadway and Aiken Avenue in that city. This is the section of street railroad trackage over which business are now being operated by Capital District Transportation Company, Inc., and the petition states that it has been agreed between the authorities of Rensselaer and the company that the tracks may be removed in view of the substitution of the motor bus line for the trolley service.

The other Rensselaer petition asks for approval of a declaration adopted by the directors of the United Traction Company for the abandonment of the so-called Third Street line in Rensselaer. This line consists of a double-track road on Broadway and Partition Street and a single track on Third Street. The municipal authorities have determined to pave Partition Street and a portion of Third Street at a cost to the company of approximately \$40,000. This line for a long time has been operated at a loss, and there is no reasonable prospect that in the future sufficient revenue can be obtained to pay its proportion of expenses of operation, taxes and interest. The company has offered to serve this territory by buses at a rate of fare the same as may from time to time be charged by the United Traction Company on its trolley lines in Rensselaer and Albany, with interchangeable transfers, but an application by the Capital District Transportation Company, Inc., to the Common Council of the city of Rensselaer for consent to operate such motor bus line was refused.

Dates for hearings upon these applications will be announced by the commission later.

Balance in Honolulu \$18,445

Operations in 1925 by the Honolulu Rapid Transit Company, Honolulu, Hawaii, were not so satisfactory as had been expected under the increased fare, but considering the large increase in the number of automobiles registered during the year a loss of passengers was to be expected. This statement was made by the manager in the annual report for the year ended Dec. 31, 1925. The balance of net revenue in 1925 carried to surplus was \$18,445, against \$21,550 in 1924.

Total revenue from all sources for the year was \$1,074,483, compared with \$1,014,349 for the year 1924. Total

operating expenses were reduced from \$713,930 to \$708,717 in 1925. In addition \$26,284 was charged to operating expenses for replacements during 1925, compared with \$25,433 for replacements during 1924. Total transportation revenue for the year was \$1,062,788, which included \$1,040,452 for passenger rev-

REVENUE AND EXPENSE ACCOUNTS OF THE HONOLULU RAPID TRANSIT COMPANY, LTD.

	1925	1924
Total revenue from transportation.....	\$1,062,788	\$1,005,193
Total revenue from other railway operations.....	\$11,695	\$9,155
Gross revenue from operations.....	\$1,074,483	\$1,014,348
Total operating expenses....	\$708,716	\$713,930
	\$365,766	\$300,418
Replacements chargeable to operating expenses.....	26,283	25,432
	\$339,483	\$274,986
Taxes.....	\$94,847	\$128,577
Profit and loss.....	826	3,261
Depreciation.....	45,155	45,089
	\$140,829	\$176,928
Net revenue from operations.....	\$198,653	\$98,057
Deductions—		
Interest.....	\$5,208	\$1,506
Dividends.....	175,000	75,000
	\$180,208	\$76,506
Balance 1925 to surplus..	\$18,445	\$21,550

enue and \$21,082 for bus revenue. In 1924 the total transportation revenue of \$1,005,193 included a passenger revenue of \$990,443 and \$11,845 bus revenue. The total number of passengers carried exclusive of transfer passengers was 17,607,737 in 1925, against 19,839,528 in 1924.

Abandonment at Chippewa Falls Approved

The Wisconsin Railroad Commission has approved the application of the Northern States Power Company to abandon railway service in Chippewa Falls as well as the interurban electric line running between Eau Claire and Chippewa Falls. The commission found that the line had suffered an operating loss for the past five years due to the use of the private auto and buses, which parallel the route of the electric line. With the passing of the interurban line service between these cities will be provided by buses. A checkup on the electric interurban line made last October showed that the number of through passengers carried between the two cities averaged $1\frac{1}{2}$ per trip.

Insull Properties Merge in New Hampshire.—The Public Service Company of New Hampshire was incorporated at Concord on Aug. 16 to take over electric utilities in New Hampshire controlled by the Insull interests of Chicago. The companies involved are the Manchester Traction, Light & Power Company, the Keene Gas & Electric Company, the Laconia Gas & Electric Company and the Souhegan Valley Electric Company. Walter S. Weyman, Augusta, Me., is president. The company will issue 400,000 shares of preferred and 200,000 of common stock of no par value.

Another Washington Merger Bill Promised.—Preparations were made on Aug. 12 by officials of the Public Utilities Commission for drafting a bill for introduction at the next session of Congress to compel a merger of the Capital Traction Company and the Washington Railway & Electric Companies. Actual framing of the measure will be done by Major W. E. R. Covell, assistant district engineer commissioner, assigned to public utilities. The bill will be modeled after a measure introduced in Congress several years ago providing for a voluntary consolidation of the traction companies. It is said, however, that the bill will penalize the companies if they fail to merge.

Chicago Firm Purchases Painesville Line.—Announcement is made of the purchase of the Cleveland, Painesville & Easton Railroad, Willoughby, Ohio, by the Hyman-Michaels Company, Chicago. The property, which consists of about 70 miles of right-of-way, will be dismantled at once, and all equipment will be put on the market.

Earnings Off in Indianapolis in June.—The June statement of the Indianapolis Street Railway, Indianapolis, Ind., shows that the total gross earnings for the month were \$451,179, compared with \$435,355 for June of a year ago. Bus receipts for June this year were \$17,454, compared with \$1,575 for the similar month a year ago. The operating expenses for June this year, however, were \$352,854, compared with \$322,326 for June a year ago. Net earnings from operation less taxes were \$70,273 for June this year, compared with \$91,826 a year ago.

Minnesota Road Does Well.—The Minneapolis, Northfield & Southern line, Minneapolis, Minn., handling passenger trains by gas-electric engines and freight by steam, reports a gain in business in the year closed. Net operating profit was \$144,598. After paying preferred stock dividends the company earned at the rate of \$47.77 a share on common. This was put back into the road.

Would Abandon Part of Troy Line.—The United Traction Company, Albany, N. Y., applied to the Public Service Commission on Aug. 11, for approval of a declaration of abandonment of part of its line in Troy. The company says the municipal authorities of Troy have determined to pave certain of the streets and an agreement has been reached whereby the trolley service is to be succeeded by a bus service.

Offer Made to Underlying Holders.—The Pittsburgh Railways, Pittsburgh, Pa., notified holders of first mortgage 5 per cent bonds of the Brownsville Avenue Street Railway, due Aug. 1, 1926, outstanding to the amount of \$300,000, that in pursuance of the policy followed with reference to other matured bonds, it was prepared to continue interest payments on this issue pending completion of the financial reorganization plan, providing for a general refunding and unifying mortgage under which bonds would be exchanged at rates to be determined. Bondholders desiring to accept this arrangement were requested to forward bonds to Pittsburgh Trust Company.

Personal Items

C. H. Jones in New Chicago Post

Charles H. Jones, for the past nine years electrical engineer of the Chicago Rapid Transit Company and the Chicago, North Shore & Milwaukee Railroad, has assumed his new duties as general manager of the Chicago, South Shore & South Bend Railroad, another of the high-speed electrically operated railroads under the management of Samuel Insull and associates.

Mr. Jones' promotion, announced in the *ELECTRIC RAILWAY JOURNAL* of Aug. 7, comes as a reward for long and faithful service, during which he has won wide recognition in the electrical

was taken over by the Insull interests. Under his direction the power system was changed from alternating to direct current, the catenary was rebuilt over a large portion of the line and eight new substations were installed.

Mr. Jones was graduated from Armour Institute of Technology in 1909 with the degree of electrical engineer. He was born in Chicago.

Despite his many duties, he finds time to take an active part in the affairs of national electrical organizations. He is chairman of the power distribution committee of the American Electric Railway Association, in which capacity he has served for the past three years. As chairman he will make the annual report of the committee at the 1926 national convention to be held in Cleveland in October.



Charles H. Jones

D. L. Smith Electrical Engineer of Chicago "L"

Dwight L. Smith, assistant electrical engineer of the Chicago Rapid Transit, Chicago, Ill., for the past seven years, has been appointed electrical engineer in charge of the electrical department, following the recently-announced promotion of Charles H. Jones to general manager of the Chicago, South Shore & South Bend Railroad.

The promotion of Mr. Smith to this position of great responsibility at the age of 36 years is a notable record of advancement in the electrical industry. Despite his comparative youth, however, Mr. Smith has had extensive experience in his chosen field. He was born in Freeport, Ill., in 1890, and received the degree of electrical engineer at the University of Illinois. He entered the Rapid Transit Line organization in 1910 as third-rail helper on the Metropolitan Division. He advanced rapidly, and in 1913 was made power supervisor of the entire elevated railway system.

Mr. Smith was serving in this capacity when in 1916 he was called to the Texas border with the National Guard, in which he served as a Second Lieutenant. In October, 1917, he went overseas with the American Expeditionary Forces as Captain of Field Artillery. He returned to civilian life in April, 1919, with the rank of major. He was promoted to assistant electrical engineer during the same year, and served in that capacity until his recent advancement.

C. F. Gustason, acting power supervisor of the Chicago Rapid Transit, Chicago, Ill., for the past two years, has been appointed chief power supervisor. His advancement to this post follows ten years of service in the main office of the electrical department. Mr. Gustason is a graduate of Crane Tech. He entered the Rapid Transit organization in 1909 as battery man on the Metropolitan Division.

Railway Man an Elmira Bank Director

Frederic H. Hill, vice-president and general manager of the Elmira Water, Light & Railroad, Elmira, N. Y., has been elected a member of the board of directors of the Chemung Canal Trust Company, Elmira. During his residence of more than ten years in Elmira he has been prominent in civic activities and in several of the town's leading industries.

Mr. Hill has been vice-president of the Elmira Water Light & Railroad Company since 1918. He joined the company in 1913 as chief engineer, and a few months later was made general manager. A steady increase in the company's business has been noticed under his managership, and additions have been made to the property. A new gas plant has been built during



Frederic H. Hill

his administration and service extended into surrounding towns and villages. He is also director of several other public utilities companies.

At the time of his appointment to the Elmira company Mr. Hill was the operating engineer of the United Gas & Electric Corporation. Before that he was connected with the Mellen banking interests on interurban electric railway work, and later with the Pennsylvania Railroad on construction and maintenance of way.

Mr. Hill was born in Bridgeville, Pa., in 1879. He was graduated from Washington and Jefferson College at Washington, Pa., and later received an engineering degree from the University of Pittsburgh.

In the *ELECTRIC RAILWAY JOURNAL* of July 7, 1923, there is an account of a celebration held by the employees of the Elmira Water, Light & Railroad Company showing their appreciation of his ten years of managership.

Henry V. Faber has been appointed assistant treasurer of the Jacksonville Traction Company, Jacksonville, Fla. The railway is under the management of Stone & Webster, Inc., of Boston, Mass., with which organization Mr. Faber was connected during the war on the Hog Island work. Later he became

field. He began work with the Chicago Rapid Transit, Chicago, Ill., immediately after his graduation in 1909 and remained continually in this service until his recent promotion.

Working his way up through the various stages of promotion from battery man on the Metropolitan Division, Mr. Jones was made electrical engineer of the Rapid Transit Lines and the North Shore Line in 1917. His first notable achievement was rebuilding the power distribution system of the Rapid Transit Lines shortly after their consolidation in 1912. This proved his capacity to handle big jobs, and he has been handling them ever since.

Mr. Jones also was in charge of all electrical work on the new Skokie Valley Route of the North Shore Line, which included the installation of catenary overhead along the entire route and part of the Shore Line Route, and the construction of five automatic substations of the latest type. Under his leadership the enormous power load required for handling the multitudes on the great Eucharistic Congress pilgrimage to Mundelein on June 24 was maintained throughout the performance of this miracle of mass transportation.

The present high standard of service being given on the South Shore Line is in great part due to the personal activities of Mr. Jones since the railroad

traveling auditor for the Boston office. Mr. Faber went to Jacksonville from the Boston office of the Haverhill Gas Light Company, where he worked on the standardization of forms and later in the treasury department.

Eldon A. Imhoff, office engineer of the Chicago Rapid Transit Company, Chicago, Ill., for the past five years, succeeds D. L. Smith as assistant electrical engineer. His promotion comes after efficient service with the company since January, 1919. Mr. Imhoff is a graduate of the University of Iowa, where he received the degree of Bachelor of Engineering in 1917. As noted elsewhere in this issue Mr. Smith has been named electrical engineer of the company.

Robert M. Davis, statistical editor of the *Electrical World* since 1919, has been made statistical adviser and consultant for all the McGraw-Hill papers. His wide experience in making statistical studies and his extensive knowledge of engineering qualify him well for this work. For several years before joining the staff of the *Electrical World*, Mr. Davis was engaged in engineering and statistical work in connection with water-power development for the United States Geological Survey. He is a graduate of the College of Civil Engineering of Cornell University, class of 1907.

Obituary

J. H. Chase

John H. Chase, district manager for the Iowa Southern Utilities Company at Burlington, Ia., died very suddenly on Aug. 14. He had been at his office the day previous.

Mr. Chase was a native of Marysville, Ohio. He was 50 years old, and had been connected with the Iowa Southern Utilities Company since 1914. He was first located at Centerville, Ia., and was later transferred to Creston. When the utility corporation took over the Walsh interests at Burlington two years ago, he was sent there as general manager. Under his direction the properties began to grow rapidly. He instituted the first bus service in the city.

Mr. Chase was a public spirited citizen. He was active in the Community Chest organization, and a director of the Greater Burlington Association and the Burlington Rotary Club, besides being affiliated with the Burlington Drama league.

Julius Thielson, formerly superintendent of the Providence & Danielson Street Railway, and retained as head of that division when the road was taken over by the Rhode Island Company, now the United Electric Railways, died in Portland, Ore., recently. He had been engaged there for the past six years in the manufacture of wood pulp for paper. Mr. Thielson, who helped lay the tracks for several transcontinental railways, went to Providence in 1900 with D. F. Sherman, who built the Providence and Danielson line. On the completion of the road Mr. Thielson was appointed superintendent.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

More Facts for Exhibitors at Cleveland

Instructions are going out from association headquarters about the shipping of material intended for use at the exhibit in connection with the meeting of the American Electric Railway Association at Cleveland, Ohio, starting on Oct. 4. Conditions are different this year from those in the past at Atlantic City. It is impossible of course to reproduce here all that the association has to say about this subject through Fred Dell, director of exhibits, but the facts are all contained in a special circular, a copy of which should be retained by the shipping department of each exhibitor and another copy by the exhibitor for his file.

The shipping instructions for freight and for express vary, but the differences are emphasized in the circular. All exhibitors should ship early, but this admonition is directed especially to those who send stuff by freight. All such shipments must be sent freight prepaid. A similar prepayment order applies to the express shipments. Norris Brothers, 2138-44 Davenport Avenue, Cleveland, are the official draymen.

To ignore the details set forth in the circular or not to follow them to the letter is to court disaster. There is no dearth of these circulars about shipping and Mr. Dell will supply as many as are needed within reason. Not only is it essential to ship material promptly, but it is highly necessary that particular attention be paid to the installation dates set forth in the circular. All exhibitors should bear in mind that likelihood that any lateness on their part in installing their own exhibit may discommode others who have been prompt in arranging their space.

Progress all along the line is reported in connection with the proposed exhibit. The sub-committee on decorations of the exhibit committee met in Cleveland, on Aug. 13, at which time bids were received from several prominent decorators. The committee is now studying the various proposals submitted and is preparing to let contracts in the near future.

General Motors Earnings Take Sharp Upward Rise

Recent feverish speculation on the Stock Exchange in issues of the General Motors Corporation, due to a statement attributed to a partner of J. P. Morgan & Company, that the stock was sure to rise in value, makes doubly interesting the balance sheet and statement for the half year ended June 30, 1926, issued on Aug. 9 by Alfred P. Sloan, Jr., president of General Motors.

Earnings for the six months considerably exceeded those of any previous

half year in the company's history, and, moreover, earnings for the second quarter exceeded those of any previous quarter of any year. The total for the six months was \$93,285,674, as opposed to \$50,363,099 for the corresponding period of 1925. The first half of 1926 showed an earning of \$17.33 per share of common stock, an increase of \$8.31 over 1925. This pronounced gain in profits was due to marked increase in volume of business, as the profit per car has been tending downward.

G.E. Employees Offer Many Suggestions

Awards totalling \$22,602 were paid to 2,172 employees of the General Electric Company during the first six months of the current year for suggestions which ranged from safety devices for the protection of workers to improved methods of manufacturing.

In all, 7,080 suggestions were made, an increase of approximately 1,500 over the first six months of last year, showing a gradual increase in the interest of employees in the company's suggestion system. For the first half of 1925, awards were made totalling \$17,510 to 1,693 employees.

The awards, which ranged up to \$500, were paid at the option of the recipient either in cash or G-E Employees Securities Corporation bonds, which yield 8 per cent as long as the original holder remains in the employ of the company.

Electricity Supplants Ice in Railroad Refrigeration

The Chicago, North Shore & Milwaukee is the latest railroad to turn to electricity as a means of solving its refrigeration problems. Five electric refrigerator cars, manufactured by the Phoenix Ice Machine Company, Cleveland, Ohio, have been purchased, and will soon begin to carry perishable produce from Chicago and Milwaukee provision houses to smaller towns along the line.

The successful application of electric refrigeration on the interurban lines of the Northern Ohio Traction Company was described in the *ELECTRIC RAILWAY JOURNAL* of Feb. 7, 1925. In that instance, conditions were such that the electric refrigerator car was able to perform in 24 hours a service similar to that performed by an ice refrigerator car in four days.

For the Chicago, North Shore & Milwaukee, the value of electric refrigeration lies not so much in the saving of time as in the way in which it meets several difficulties peculiar to the railroad. For example, one of the serious objections to ice refrigerator cars was the dripping from the ice bunkers, since the tracks of the company are elevated in the city of Chicago. More-

over, since the railroad is electrified, the cost of necessary power is considerably less than that of ice. Also, the electric refrigerator car operates automatically, and requires no special organization to care for it. Thus, its overhead expense is nominal.

Frameless Truck Electric Switching Locomotive

A switching locomotive, known as the frameless truck type, which embodies several unique features of design, has recently been supplied to the Delaware, Lackawanna & Western Railroad for use at the company's Wallabout terminal, Brooklyn, by the General Electric Company.

The most important feature of this design is the truck, which is a departure from the usual construction of swivel truck locomotives. In place of the customary two axle bearings of the motor and the two truck journal bearings, the motor itself is modified in its external construction and provided with a single substantial bearing in place of the usual auxiliary bearings. The gears occupy their usual location, but no external journals are used. On this account the locomotive has the appearance of what is commonly called the inside-hung bearing type of truck design.

Each motor frame is cast with two pairs of lugs directly over the axle bearing to receive the ends of the equalizers. A substantial pin passes through the end of an equalizer and the lugs are so spaced as to serve as guides for the equalizers.

Two equalizers forged from steel bars perform the usual functions of truck equalizers in supporting the trans-



A Departure from the Usual Truck Design Has Been Made for This Locomotive

som and, in addition, tie the trucks together and hold the parts in alignment.

The steel bolster is cast with the truck portion of the center plate with recesses and lugs for the motor noses and safety lugs and with slotted extensions for the brake hangers and levers. The transom, supporting the weight of the superstructure, the brake rigging and about half the weight of each motor, is in turn carried on coil springs which rest in spring hangers suspended from the equalizers. Vertical slots in the transom at opposite sides of the center plate serve as guides for the two equalizers.

The electrical equipment consists of four GE-207, 110-hp. motors, similar in all respects to the usual railway type motor except in the external form of the frame. Type M control is used, including the master controller and the necessary auxiliary contactors and rheostats. Compressed air is furnished

by a 600-volt motor-driven air compressor having a rated piston displacement of 50 cu.ft. of air per minute.

The specifications of the new type locomotive follow:

Over-all length	29 ft. 2 in.
Over-all width	9 ft. 0 7/8 in.
Height over cab	11 ft. 9 3/4 in.
Height over trolley locked down ..	16 ft. 8 1/2 in.
Maximum height, trolley up ..	25 ft. 6 in.
Total wheelbase	18 ft. 8 in.
Rigid wheelbase	6 ft. 2 in.
Diameter of driving wheels	36 in.
Minimum radius of track curvature	45 ft.
Total weight, all on drivers ...	100,000 lb.
Weight per driving axle	25,000 lb.
Operating voltage	600 volt, d.c.
Motors	Four GE-207-G.

Portable Generator Receives Approval of Underwriters

The medium pressure portable acetylene generator manufactured by the Bastian-Blessing Company, Chicago, Ill., is the first machine of this type to be approved by the Underwriters, according to recent statements made by officials of the company. This approval was not given until the generator had passed through several stringent tests.

Its stability was demonstrated by the fact that it failed to tip over when its side was raised 21 in. or when its front was raised 66 in. Its safety was proved by two other tests. In the first of these the generator was set to producing gas at 10-lb. pressure and then thrown on its side, while in the second test the carbide feed was locked and the machine again thrown on its side. In both cases, when the generator was righted, it had suffered no damage and operated perfectly.

Large Equipment Order Placed at Seattle

The City Council of Seattle has authorized the Board of Public Works to enter into a contract with the St. Louis Car Company for 80 new street cars at a cost of \$1,400,000. This is an expenditure of \$120,000 more than now is available for this purpose. This action by the Council reverses its former mandate to the board that the fund of \$500,000 for a street car bridge across the West Waterway on West Spokane Street should not be touched to buy new equipment. The Council states that the estimate upon which the former allocation was made provided for paving the street car bridge, which is now considered unnecessary.

ELECTRIC RAILWAY MATERIAL PRICES—Aug. 17, 1926

Metals—New York

Copper, electrolytic, cents per lb.	14.525
Lead, cents per lb.	8.90
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.75
Tin, Straits, cents per lb.	64.75
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.: ..	
Commercial grade	55.00
General service	30.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	\$5.00
Somerset mine run, Boston	1.95
Pittsburgh mine run, Pittsburgh	2.00
Franklin, Ill., screenings, Chicago	1.825
Central, Ill., screenings, Chicago	1.50
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	\$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.20
Steel bars, cents per lb.	2.05
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	\$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.10
Sheet iron, galvanized (28 gage), cents per lb.	4.25
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	3.10

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.: ..	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	12.80
Whitelead in oil (100 lb. keg), cents per lb.	15.25
Turpentine (bbl. lots), per gal.	\$0.9925
Car window glass, (single strength), first three brackets, A quality, discount* ..	84.0%
Car window glass, (single strength), first three brackets, B quality, discount* ..	86.0%
Car window glass, (double strength) all sizes, A quality, discount* ..	85.0%
Putty, 100 lb. tins, cents per lb.	5.25-5.50

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire, cents per lb.	16.25
Rubber-covered wire, No. 14, per 1,000 ft.	\$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	\$147
Wood block paving 3 1/2 x 16 lb. treatment, N. Y., per sq. yd.	\$2.70
Paving brick 3 1/2 x 8 1/2 x 4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3 1/2 x 8 1/2 x 4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, 1-in., carload lots, N. Y., per cu. yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, 1-in., cu. yd., f.o.b. N. Y.	1.75
Sand, cu. yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	12.00
Light copper, cents per lb.	10.125
Heavy brass, cents per lb.	7.50
Zinc, old scrap, cents per lb.	4.375
Lead, cents per lb. (heavy)	7.75
Steel car axles, Chicago, net ton	\$17.75
Cast iron car wheels, Chicago, gross ton ..	16.25
Rails (short), Chicago, gross ton	17.75
Rails, (relaying), Chicago, gross ton	26.00
Machine turnings, Chicago, gross ton	7.50

Memphis Cars Are Now Completed



New Memphis Cars Present Excellent Appearance

Delivery has just been made of 32 single-end, one-man street cars ordered from the St. Louis Car Company in February by the Memphis Street Railway of Memphis, Tenn. The cars are of steel construction and weigh but 35,090 lb. They are destined for use in city service. Following are principal specifications on the new equipment:

Seating capacity	56
Weight:	
Car body	16,000 lb.
Trucks	10,520 lb.
Equipment	8,570 lb.
Total	35,090 lb.
Bolster centers, length.....	22 ft. 0 in.
Length over all.....	46 ft. 2 in.
Truck wheelbase.....	4 ft. 10 in.
Width over all.....	8 ft. 4 1/2 in.
Height, rail to trolley base.....	11 ft. 0 1/2 in.
Body	Steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	General Electric
Bumpers	Hedley anti-climber
Car signal system.....	Faraday
Car trimmings	Polished bronze
Control	K-35 single-end
Curtain fixtures.....	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism.....	National Pneumatic
Fare boxes	Johnson, air operated
Fenders	Memphis standard
Gears and pinions.....	General Electric
Hand brakes	St. Louis Car Co.
Heater equipment	Consolidated Car Heating Co.
Headlights	Golden Glow
Motors.....	Four General Electric 35 hp., outside hung
Paint	St. Louis Car Co. system
Registers	International, electrically operated
Safety Devices.....	Safety Car Devices Co.
Sanders.....	Keystone air operated traps
Sash fixtures	Rex brass sash
Seats.....	Hale-Kilburn de luxe non-reversible
Seating material	Plush
Step treads.....	Irving Iron Works "Safkar"
Trucks	Brill
Ventilators	Nichols-Lintern
Wheels.....	Chilled iron, 26-in.

Rolling Stock

Steubenville, East Liverpool & Beaver Valley Traction Company, Steubenville, Ohio, has ordered eight new interurban cars, costing approximately \$131,000, for trunk line service between Steubenville and Beaver. These cars,

which are manufactured by the G. C. Kuhlman Car Company, Cleveland, Ohio, are more than 48 ft. in length and unusually low, measuring only 10 ft. 8 in. from wheel tread to roof.

New York, Westchester & Boston Railway, New York, N. Y., has ordered 20 steel vestibuled, Brinkerhoff cars from the Pressed Steel Car Company. Each seats 80 passengers. Deliveries will commence in September. Some of the principal specifications are as follows:

Number of cars ordered.....	20
Approximate weight:	
Car body	64,800 lb.
Trucks	32,883 lb.
Equipment	29,837 lb.
Total	126,900 lb.
Bolster centers, length.....	47 ft. 7 1/2 in.
Length over all.....	72 ft. 7 1/2 in.
Truck wheelbase	8 ft.
Width over all.....	10 ft. 4 in.
Height, rail to pantograph.....	14 ft. 7 in.
Body.....	All steel
Interior trim	Agasote and steel
Headlining	Agasote
Insulation	Three-ply Salamander and Tucork
Floor	Red Flexolith
Air Brakes	Westinghouse
Armature bearings	Sleeve
Axles.....	5 1/2 x 10-in. Standard Steel Works
Car trimmings	Statuary bronze
Center and side bearings.....	Pressed Steel and Perry
Compressors	Westinghouse XD-BG-2
Conduits and junction boxes.....	Westinghouse
Control	Westinghouse AB.
Couplers	Pitt
Curtain fixtures	Curtain Supply Co.
Diaphragm	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Stencilled steel
Door operating mechanism	National Pneumatic
Draft Gear.....	Waugh
Finish	Devoe & Reynolds enamel
Gears and pinions	Nuttall BP flexible
Hand brakes	Blackhall
Heater equipment	Gold
Headlights	14 in. Golden Glow
Journal bearings	5 1/2 x 10 in. sleeve
Journal boxes	Symington
Motors	Two Westinghouse 409-B2, inside hung
Pantograph	Nuttall 131-A
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn 392
Seating material	Pantasote No. 85
Slack adjuster	Westinghouse type "L"
Springs	Railway Steel Spring
Step treads	Kass safety
Trucks	Pressed Steel Car Co.—built up
Ventilators	Ten Utility
Wheels	36-in. rolled steel, 42-in. bolted steel

Track and Line

Cincinnati Street Railway Company, Cincinnati, Ohio, is expending approximately \$35,000 in relaying 3,000 ft. of single track on McMicken Avenue. The new rails are of the 7-in. types, laid on steel ties imbedded in concrete.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has started work on track improvement program on its Twenty-seventh Street line between Hopkins Street and Atkinson Avenue, where a new double track will replace the present single track line at an estimated cost of \$85,000.

Montreal Tramways, Montreal, Que., has started preliminary work on constructing its new line to the top of Mount Royal. Engineering difficulties are considerable, as the line will reach an elevation of 690 ft., passing over an elevated viaduct at one point, and in another place going through a tunnel about 300 ft. in length. The line will cost approximately \$600,000 and will be ready for operation next spring.

Hydro-Electric Railways, Windsor, Ont., has given out contracts for excavation work in preparation for laying 8,400 ft. of new track on Ouellette and Wyandotte Streets, Windsor.

Trade Notes

Reo Motor Car Company, Lansing, Mich., states that more Reo Model W buses were shipped in July than in any other month in the history of the company. The statement was also made that more buses were shipped during the fiscal year, which ended July 31, than in the previous year and that the company entered the month of August with a large volume of unfilled orders.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a folder, No. 4710, describing standard gasoline-electric equipment for rail cars. The information about this equipment is classified under four heads: Generating equipment, motors, car data, and performance.

Fisemann Magneto Corporation, New York, N. Y., announces the occupation of its new direct factory branch building at 6511 Lincoln Avenue, Detroit, Mich. Ground was broken for the erection of the structure in April, and building operations were completed July 15.

New Advertising Literature

United States Graphite Company, Saginaw, Mich., has issued a pamphlet describing in detail its line of motor and generator brushes. General suggestions for eliminating brush troubles are also included.

Crouse-Hinds Company, Syracuse, N. Y., has issued a folder describing various types of "Arkrite" plugs and receptacles, interlocking switches and plugs and safety hand lamps.

Ohio Brass Company, Mansfield, Ohio, has issued a leaflet which lists several new features responsible for the longer service of the O-B Feist trolley wheel.



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“Trolleying de luxe,—

means rapid and comfortable transportation and better interurban service. This is the new sport which will call to every resident living along the Marietta and Stone Mountain interurban lines of the Georgia Railway & Power Company, Atlanta.”

Quoted from the edition of *The Atlanta Constitution* commenting on the ceremonies in connection with placing into service the Company's ten new interurban cars, the last word in modern design.

Of course these new cars are equipped with Peacock Staffless Brakes. The most modern cars are! Modern design demands the Peacock because of minimum platform space occupation; simplicity of operation; low installation and maintenance costs, and tremendous braking power.

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50 Church St.
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Street Railway Inspection
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When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

The Most Successful Men in the Electric Railway

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ELECTRIC RAILWAY JOURNAL

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Adapted to all
Types of rails
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GODWIN Steel Paving Guards

Proven by service to economically prevent seepage and disintegration of street railway paving.

Write for Illustrated Catalog No. 20

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"Axle Specialist Since 1866"
Address all Mail to Post Office Box 515, Richmond, Va.

CAR AXLES J. R. JOHNSON AND CO., INC. FORGED STEEL AXLES

For Locomotives, Passenger, Freight and Electric Cars
Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large Shafts, Round Bars, etc.



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ACME Window Curtain Fixtures

Noiseless—direct acting—enlarged friction surface—less parts—stronger—more easily and finely adjusted.

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MOHAWKS

Go Farther!

A handsome tire—strong—clean-cut—well balanced appearance. It looks like a super quality tire—AND ACTS LIKE IT. Try them the next time. You won't regret it.

THE MOHAWK RUBBER COMPANY
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Branches in Principal Cities
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The Canadian Pacific Railway chose the Fageol Safety Coach

After a minute and careful engineering investigation of the entire motor bus field, the Canadian Pacific Railway Company chose Fageol Safety Coaches to equip its bus operating subsidiary, the Canadian Pacific Transport Company, Ltd.

They bought on the basis of established and demonstrated facts—superior earning power, through greater passenger appeal, and lower “last costs.”

A year’s operation has vindicated the judgment of the C.P.R. in their selection.

FAGEOL
SAFETY COACH

The Economy of the Fageol is Fundamental

Take for example the Hall-Scott Engine, designed throughout to meet the severe requirements of motor bus work. It offers the following exclusive features:

1. Quickly replaced interchangeable units throughout.
2. A lubricating system which constantly refines and purifies the crankcase oil, holding it at its original viscosity for thousands of miles.
3. Complete cam and valve mechanism contained in interchangeable head. Valve grinding, maintenance work on head, and replacement of worn parts do not tie the bus up needlessly for hours or days.
4. Radiator mounted as unit with engine, so weaving of frame does not damage it.
5. Stainless steel pump shaft running in soft metal glands, eliminating troublesome pump leaks.
6. Higher compression ratio, to get more power out of the fuel.

7. Heavyweight aluminum alloy pistons, which limit carbon formation.

8. Combustion chamber design and valve arrangement which makes the necessity of valve grinding quite infrequent.

—and many more.

The final test of all endeavors to create a better, or more economical, more durable product is this: How does it work out in the hands of the user?

Operators who have used the Fageol Hall-Scott engine for 300,000 miles or more say that there is no reason to believe that it will ever wear out. It is brutally strong, and the occasional replacement of a few simple parts brings the engine back to new condition.

Its phenomenally low maintenance cost, and its economy of fuel and oil, have been the chief contributing causes which have created the recognition for economy enjoyed by the Fageol Safety Coach.

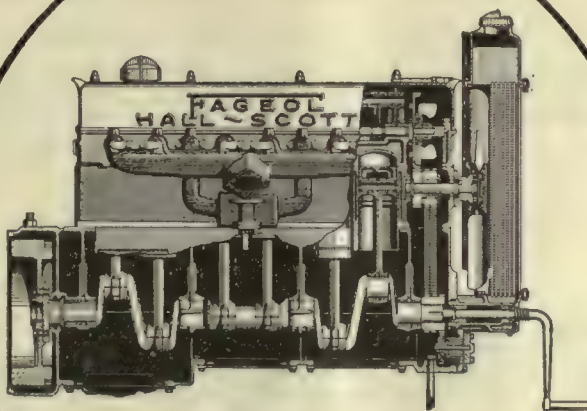
Ask for complete descriptive information

THE FAGEOL COMPANY

A Division of

AMERICAN CAR and FOUNDRY MOTORS COMPANY

30 CHURCH STREET, NEW YORK, N. Y.





First Mack bus *running on a regular route between U. S. and Canada* **rides on Generals**

The same famous tire which has brought tire costs per mile down to the lowest possible level for large fleet operators thruout America is repeating its achievement on the handsome carrier pictured on this page—the first Mack bus to operate on a regular route between the United States and the Dominion.

100% General equipment makes it possible for the owners of this bus to maintain a rigid schedule between Buffalo, Niagara Falls and St. Catherines, Ontario.

100% General equipment provides maximum protection against the jolts and jars of the road, hence royal comfort for the 25 passengers inside the bus and utmost protection for the bus mechanism.

More than that, the lower rolling-resistance of The General Cord assures the owners of this bus a substantial reduction in power and gasoline consumption—and that means the lowest possible cost of operation—the one thing every bus operator wants!



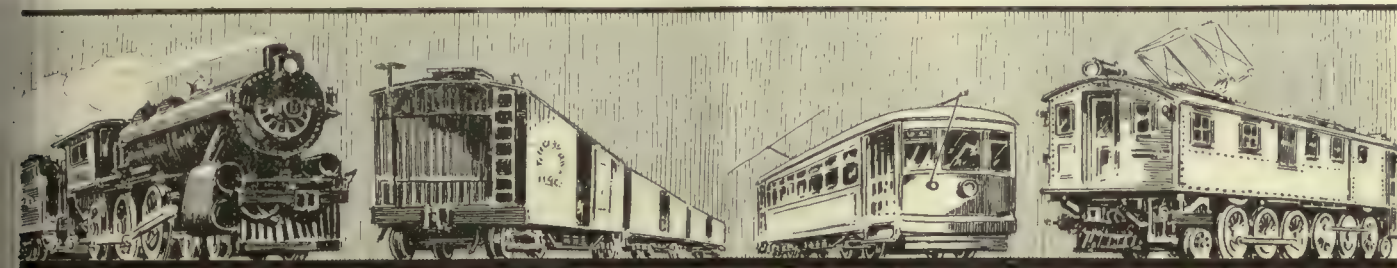
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GENERAL TIRE

—goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.

RAILROAD CONSTRUCTION for HIGHWAY TRANSPORTATION



Multi-wheel traction is as necessary on
the highway as on the railway — —



LONGER LIVED EQUIPMENT

LOWER MAINTENANCE COST

GREATER EARNING POWER

THE SAFEWAY SIX-WHEELER

THE SIX WHEEL COMPANY, 1800 W. LEHIGH AVENUE, PHILADELPHIA, PA.

Manufacturers of De Luxe, City, and Double Deck Type Six-Wheel Coaches



Goodyear-equipped motor coach of the Red Star Transportation Company, Lexington, Kentucky

What SUPERTWIST Adds to Goodyear Tires

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other in-

juries. It thus insures virtually double the carcass life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.



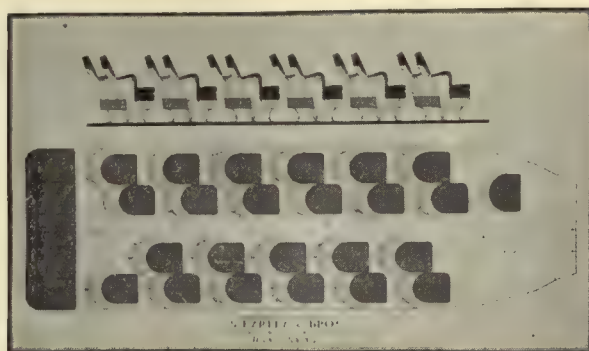
Interior view of deluxe coach with Karpen 37" "Staggard" seating, showing increased comfort, privacy and added aisle space.



More Space, Freedom and Comfort with KARPEN "Staggard Seats"

That extra room, increased comfort and privacy, that wider aisle that you have been wanting; -- you can have all these things now, and without sacrificing seats or revenue. Karpen has solved a difficult problem with a distinctly new type of seat. Out of thirty odd years of experience in building parlor, dining and club car seats for the finest railroad service and a careful study of the bus operator's problems came the Karpen "Staggard" double chair. The overlap of the passengers' shoulders gives perfect freedom from crowding, the chief cause of discomfort in ordinary double seats. Notice

the floor plan, which explains how the Karpen "Staggard" seating arrangement gives greater available aisle space. In fact, thirty seven inch Karpen "Staggard" double chairs leave $5\frac{1}{2}$ inches more aisle space than thirty five inch regular double bus seats.



(Patents Pending)

Remember that all Karpen coach chairs are built of indestructible fiber, with steel reinforcement in every upright stake, and genuine leather cushions on seats and backs. Climatic conditions and temperature have no effect on this construction.

Karpen leads in quality transportation seating.

Karpen
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S. KARPEN & BROS.

General Offices, 636-678 West 22nd Street
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Medium-size busses are

That's Why Operators Are Swinging To Studebaker Equipment

THE first of the year the Columbus Transportation Company, Columbus, Georgia, motorized one of their electric lines with eight heavy truck-type busses of 29-passenger capacity. A few months' trial convinced them that they could not operate these large units at a profit. So they were replaced with ten Studebaker 21-passenger street car type busses. These low-cost, medium-size Studebakers proved so profitable that they have since purchased seven additional Studebaker busses of the same type for use on another route.

Changing to Medium-Sized Equipment

Experienced bus operators everywhere are replacing heavy truck-type busses with medium-size units. Bus equipment is changing in the same way that street railway equipment has changed.

Early street cars were small, single-truck affairs, seating 20 to 25 people. Bigger equipment seemed to be the key to bigger profits. So heavy, double-truck cars were installed—cars that had more seats, but cost more to buy and more to operate.

What was the result? Occasionally the bigger cars were filled, *but on the average they carried no more passengers than the small cars.* Profits, instead of increasing, melted away, and large cars are now being replaced with smaller, one-man-type cars.

Equipment Must Fit the Average Load

Street car operators have proved conclusively that the only equipment that pays a profit is equipment of the right size to handle the *average* load. Exactly this same principle applies to bus operation. Except at rush hours, large-size busses are half empty—often run at a loss. Studebaker bus equipment—because it is medium-size—not only meets the average load requirements but also yields more consistent profits. For its first cost, operating cost, maintenance and depreciation costs are less.

It is significant that two Studebaker busses can be purchased at practically the same cost as one heavy, truck-type bus. An operator can use the extra Studebaker bus for rush hour business without penalizing profits in slack periods, taking it off when travel is light. The extra equipment can also be used for auxiliary service such as picnics, excursions, etc.

How Size of Equipment Affects Net Income

by J. A. Emery

Vice-President, Ford, Bacon and Davis, Inc.

"The choice of equipment may make or break a bus line. . . Scrutiny of operating expenses reveals that many companies running smaller busses generally operate for less per bus-mile than companies operating larger busses. . . under similar conditions, the difference in operating expenses of a 21-seat bus as compared with a 29-seat bus amounts to from 3½ to 5½ cents per bus mile."

Profit by Street Railways' Experience

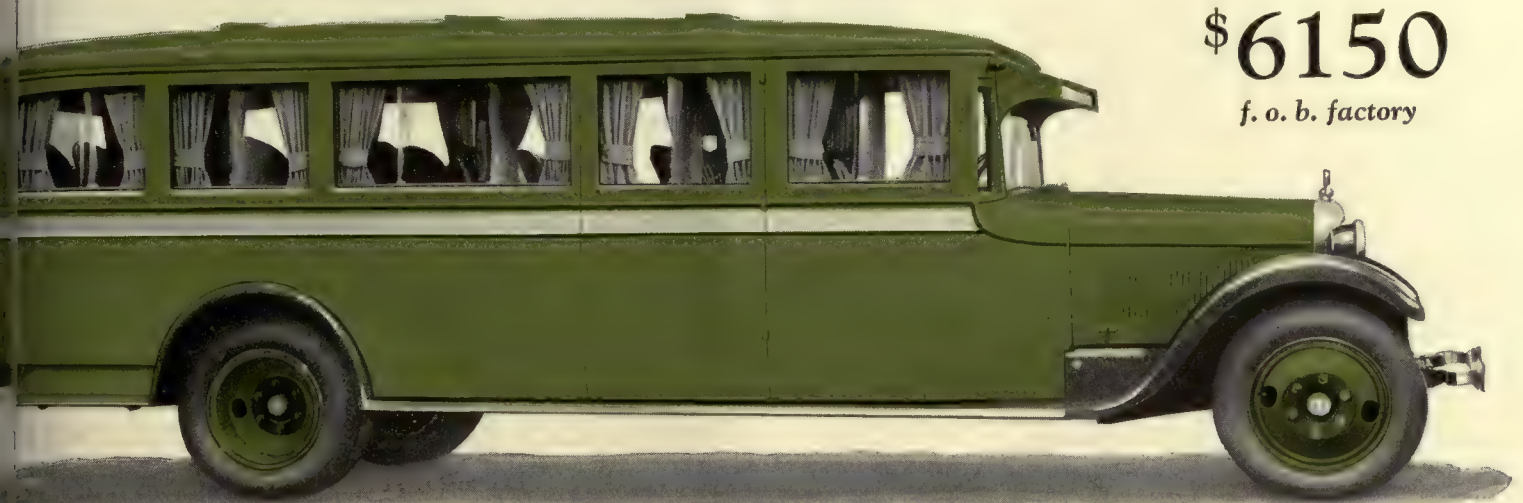
The bus operator can profit by the experience of the street railway companies in gauging the size of equipment most profitable to operate. Over 1200 operators are now using Studebaker equipment—and Studebaker busses are operating in every state in the Union.



The Columbus Transportation Company of Columbus, Georgia, recently replaced eight heavy truck-type busses with these ten medium-size Studebakers. The Studebaker equipment proved so satisfactory that they have since purchased seven more of the same type for operation on another route. One more example of the many bus operators who are swinging to medium-size equipment.

STUDEBAKER

PROFIT-SIZE busses!



\$6150

f. o. b. factory

Studebaker 20-Passenger Parlor Car De Luxe

US operators have enthusiastically received the new Studebaker Parlor Car De Luxe. *First*, because of its beautiful design and unusual comfort. *Second*, because it combines remarkably low first cost—\$6150—with low operating cost.

Ultra-smart appearance

Appearance and luxury of riding comfort, it can be compared only to the large parlor car busses selling at from \$10,000 to \$12,000.

Note the low-hung body with its graceful tapering roof. Length overall, 283¾ inches. Framework is of selected hardwood. Finish rich, durable lacquer.

Entrance door (32 inches wide) is on the forward right-hand side. Controlled by hidden mechanism, which is operated by a small hand lever at the left of the driver's seat. Separate door for driver. Emergency door at rear.

Luxurious, roomy interior

Every interior feature is painstakingly planned to give most physical and mental relaxation to passengers. Individual armchairs, upholstered in genuine leather, with cane sides. Liberal leg room (30 inches) and head room (61 inches). Broad center aisle. Accommodates 20 passengers, including driver.

Adjustable windows with boquet draperies; mohair lined and side lining; dome lights; window-post mirrors; automatic heating system. Six ventilators are provided—one in the cowl, two over the windshield, and three in the roof—insuring continuous circulation of air without draft. There is a railed-in baggage compartment at the driver's right. Railed-in roof space for additional baggage provided without extra charge, if desired.

Most powerful bus chassis of its size and weight

Mounted on specially designed Studebaker bus chassis, this bus is ideal for intercity and suburban service. It has the speed, stamina and dependability to answer the severest demands of service.

According to the rating of the Society of Automotive Engineers, it is the most powerful bus chassis of its size in the world. There are 33 bus chassis on the market with *less* rated power and *more* weight.

The chassis is sturdily built, with surplus strength. It is not a truck chassis—or a passenger-car chassis which has been lengthened and, therefore, weakened by splicing. Extra safety factors are included in its design. Rear axle shaft is extra large; propeller shaft is oversize for extra strength. Springs are extra sturdy and resilient. Four-wheel hydraulic brakes are supplemented by a service brake on the rear wheels and an emergency brake on the driveshaft.

Unusually complete equipment

Equipment is complete, including stop signal system; illuminated destination sign box (above windshield); automatic windshield cleaner; rear-view mirror; front and rear bumpers; motometer; extra wheel with tire, tube and carrier, mounted on fender; 8-day clock and gasoline gauge, plus the usual instruments, mounted in an oval group under glass; inspection lamp with 10-foot cord. Lights are controlled by a steering wheel switch.

Due to standardized design and large-scale production, the new Studebaker Parlor Car De Luxe is offered at a remarkably low price. Operators find that

its smart appearance and luxurious riding comfort attract continuous patronage, while its very low initial and operating costs insure *much higher profit per passenger mile*.

L
—first, cost
—operating cost
—maintenance cost
—depreciation cost
Lower

Ex Body Designs, 12 to 21 Passengers, \$3935 to \$6150

Prices f. o. b. factory, covering body and chassis, complete. Purchase can be arranged on a liberal Budget Payment Plan—Small down payment and balance in convenient monthly installments.

1-Pass. (including driver) cross-seat Sedan-Type.....	\$3935
1-Pass. (including driver) cross-seat Sedan-Type.....	\$4295
1-Pass. (including driver) side-entrance Parlor Car.....	\$5300
1-Pass. (including driver) cross-seat Sedan Type.....	\$5050
1-Pass. (including driver) Parlor-Car De Luxe*.....	\$6150
1-Pass. Pay-As-You-Enter Street-Car Type*.....	\$5125

*Includes dual rear wheels

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B South Bend, Ind.

Send me free "Profitable Bus Operation" without obligation.

Name.....

Address.....

City.....State.....

We have.....busses at present.

Check below the Studebaker Bus about which you desire information.

Type: Sedan.....Parlor Car.....Street-Car Type.....

Capacity:.....Passengers.

Mail
this
coupon
for
further
particu-
lars
FREE

BUSSSES

MORE PROFIT PER PASSENGER MILE



MORE MILEAGE PER DOLLAR OF COST

What, next to safety and dependability, is the most important requirement you look for in wheels for electric railway service?

Isn't it economical mileage—greater service per dollar of cost?

The Illinois Steel Company begins to build economical mileage into Gary Wrought Steel Wheels at the very first stage of manufacture, where the specialized knowledge gained in years of steel-making experience is utilized to produce the cylindrical block of high-grade open-hearth steel that eventually becomes the finished wheel.

The care with which the open-hearth record and chemical composition are checked, and the painstaking way in which all blocks are chipped and inspected, are further steps in the journey.

From the wheel block yard, down on to the ten thousand-ton hydraulic press, the hub punch, the rolling mill, the coning press, the first inspection, the machining operation, the second inspection and the warehouse—the course of Gary Wheels toward economical mileage is unswerving.

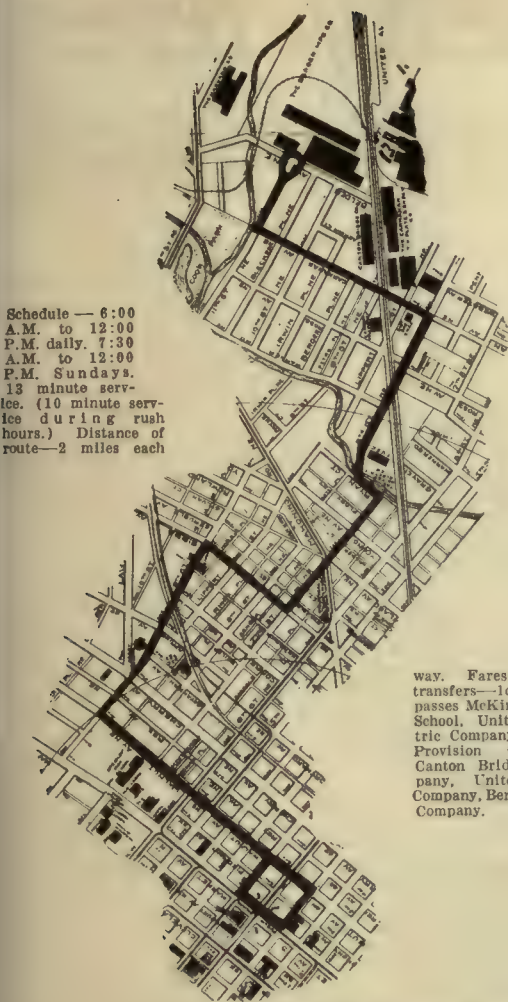
All of which helps to explain the favor these wheels enjoy. Our wheel specialists are at your command.

Illinois Steel Company

General Offices: 208 South La Salle Street, Chicago, Illinois

G A R Y
WROUGHT STEEL WHEELS





Schedule — 6:00
A.M. to 12:00
P.M. daily. 7:30
A.M. to 12:00
P.M. Sundays.
13 minute serv-
ice. (10 minute serv-
ice during rush
hours.) Distance of
route—2 miles each

way. Fares — 5c.,
transfers—1c. Route
passes McKinley High
School, United Elec-
tric Company, Carson
Provision Company,
Canton Bridge Com-
pany, United Alloy
Company, Berger Mfg.
Company.

ROUTE NO. 1—GREEN LINE TRANSIT COMPANY,
CANTON, OHIO.



Traffic Control

The increasing traffic on both City Streets and the Open Road demands the best attention of bus operators everywhere. Public opinion frowns on large, cumbersome vehicles that require excessive space on thoroughfares. Bus operators need the good will of the public. They need to cater to public opinion on this issue. They need to maintain schedules for their patrons, which becomes more of a problem with larger type buses as traffic increases.

A bus with a powerful six-cylinder motor, with a low center of gravity, with a pick-up and get-away, with attractive and harmonious bodies, light in weight and appealing in sight, with quick-acting brakes (particularly the four-wheel hydraulic brakes), can do much for the operator to help in "Traffic Control."

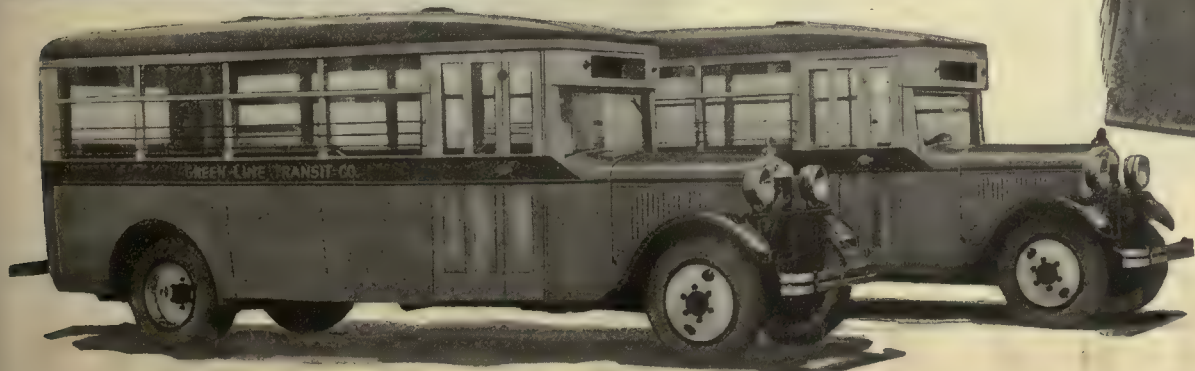
The Garford Greyhound has these qualities. They have set a higher standard for revenue producing.

GARFORD PIONEERED 4-WHEEL BRAKES ON
MOTOR BUSES

Garford Truck Co.

647-847 Wapak Road, Lima, Ohio

Garford "Quality Built" Buses are described in the booklet here illustrated. You may have a copy for the asking.



"Nothing but Kelly tires.. will go on our busses"

SCHAPPI BUS LINE, INC.
821 GARFIELD AVE. PHONE HAMMOND 2403
CALUMET CITY, ILLINOIS

February 23, 1926.

Kelly-Springfield Tire Company,
2001 W. Pershing Road,
Chicago, Illinois.

Gentlemen:

You have requested in your communication of recent date that we furnish you with information relative to the results secured from your Heavy Duty tires operating on the eight busses which we have in service between Chicago and Hammond, Indiana. It gives us great pleasure to relate that experience with your tires which has been so satisfactory to us.

Our run is about twenty-five miles each way, and we have to date forty of your tires in service, the first of which was purchased in October of 1925. Those tires have been driven approximately 15,000 miles and their appearance is excellent. We were using one of the well known makes of bus tires prior to our experience with your product, and we are very pleased to state that the service which your equipment has given has reduced our tire bills in the neighborhood of 50%.

Your tires appear to be more resilient than those which we have used in the past and fulfill our every requirement. We did not believe there was so much difference in tires until Kelly Heavy Duties were placed in service. You have attained a genuine accomplishment in manufacturing such a perfectly balanced product, and you may rest assured that nothing but Kelly-Springfield tires will go in service on our busses.

We will be more than pleased to furnish a favorable report to anyone who desires information relative to the performance of your product.

Very truly yours,

Harry Schappi, Inc.
SCHAPPI BUS LINE, INC.



KELLY HEAVY DUTY CORD

Fageol Coaches
Garford Buses and Trucks
GMC Trucks
Graham Brothers Coaches and Trucks
International Coaches and Trucks
Mack Buses and Trucks
Safeway Buses
Studebaker Buses
White Buses and Trucks
Yellow Coaches

24 buses and trucks of 10 different makes were exhibited at the 1926 convention of the American Railway Association.

Every one of the motor vehicles submitted to these transportation experts was equipped with Timken Tapered Roller Bearings.

And in regular production, 95% of ALL makes of buses and trucks in America are Timken-equipped.

Timkens are used in transmissions, differentials, pinion or worm mountings, rear wheels, front

wheels, steering pivots, fans, and auxiliary drives.

Timkens keep these units rigid, quiet, highly wear-proof and compact. Timkens do it with their tapered design, *POSITIVELY ALIGNED ROLLS* and Timken-made steel. These features enable Timken Bearings to carry thrust and all other loads, with less friction, and in less space for any given capacity.

The cash value of such bearing characteristics is clear from the unanimous choice of Timkens by makers and users of commercial vehicles.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN
Tapered
ROLLER BEARINGS

100 • YEARS • OF • MANUFACTURING • EXPERIENCE •



The Latest H-W Driver Seat Adjusts to Comfort and Safety

THIS new adjustable H-W driver seat is a welcome advance in comfort and control for the operator. Special malleable iron pedestal construction allows four height adjustments. Seat also slides three inches forward or backward. Cushion and back springs are carefully worked out to give maximum support and driving comfort.

SEATS Nos. 55-P and 11-F are worthy examples of the complete H-W passenger seating lines: the former for middle distances where extra comfort is desired; the latter for extreme comfort on cross-country tours and intercity service. We have a full line of reed seats, too.



Driver Seat
No. 13



Seat No. 55-P



Seat No. 11-F

*Ask for the free advice of our
transportation engineers on
all your car seating
problems*

Heywood-Wakefield

REG. U.S. PAT. OFF.

HEYWOOD-WAKEFIELD SALES OFFICES

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Railway & Power Engineering Corporation,
133 Eastern Ave., Toronto;
Montreal; Winnipeg, Canada

FISK

TRANSPORTATION
"Fillerless"
CORD TIRES



Time to Re-tire
Get a FISK
TRADE MARK REG. U. S. PAT. OFF.

A trial on a competitive basis convinced The Overland Motor Coach Company that Fisk Transportation "Fillerless" Cords deliver service at the lowest cost per mile.

Fall River, Mass.

The Fisk Tire Company, Inc.,
Chicopee Falls, Mass.

Gentlemen:—A trial on a competitive basis has convinced me that your transportation cords on my busses are in the same position relatively as your Red-Top Tires are to other makes on my light cars.

Your product is not exactly new to me, although the bus tire is comparatively so. I rode on Fisk in the old days of the "Bicycle Craze" and you surely have kept pace with the times.

With best wishes for your future success, I am,

Sincerely yours,

The Overland Motor Coach Company,
William S. Oakley, Pres.

You'll find it well worth while to learn more about this great commercial tire from one of the 145 direct Fisk branches or the thousands of Fisk Franchise dealers in all parts of the country.

The Fisk Tire Company, Inc.
Chicopee Falls, Mass.

Fisk Transportation "Fillerless" Cords are made in all bus and truck sizes.



4

*Important points to remember for
a Complete American Electric Railway Association
Convention Sales Program*

EXHIBIT SPACE AT THE CONVENTION

ELECTRIC RAILWAY JOURNAL

Convention Number

Dated September 25, 1926

ELECTRIC RAILWAY JOURNAL

Convention Dailies

Dated October 5, 6, 7, 1926

ELECTRIC RAILWAY JOURNAL

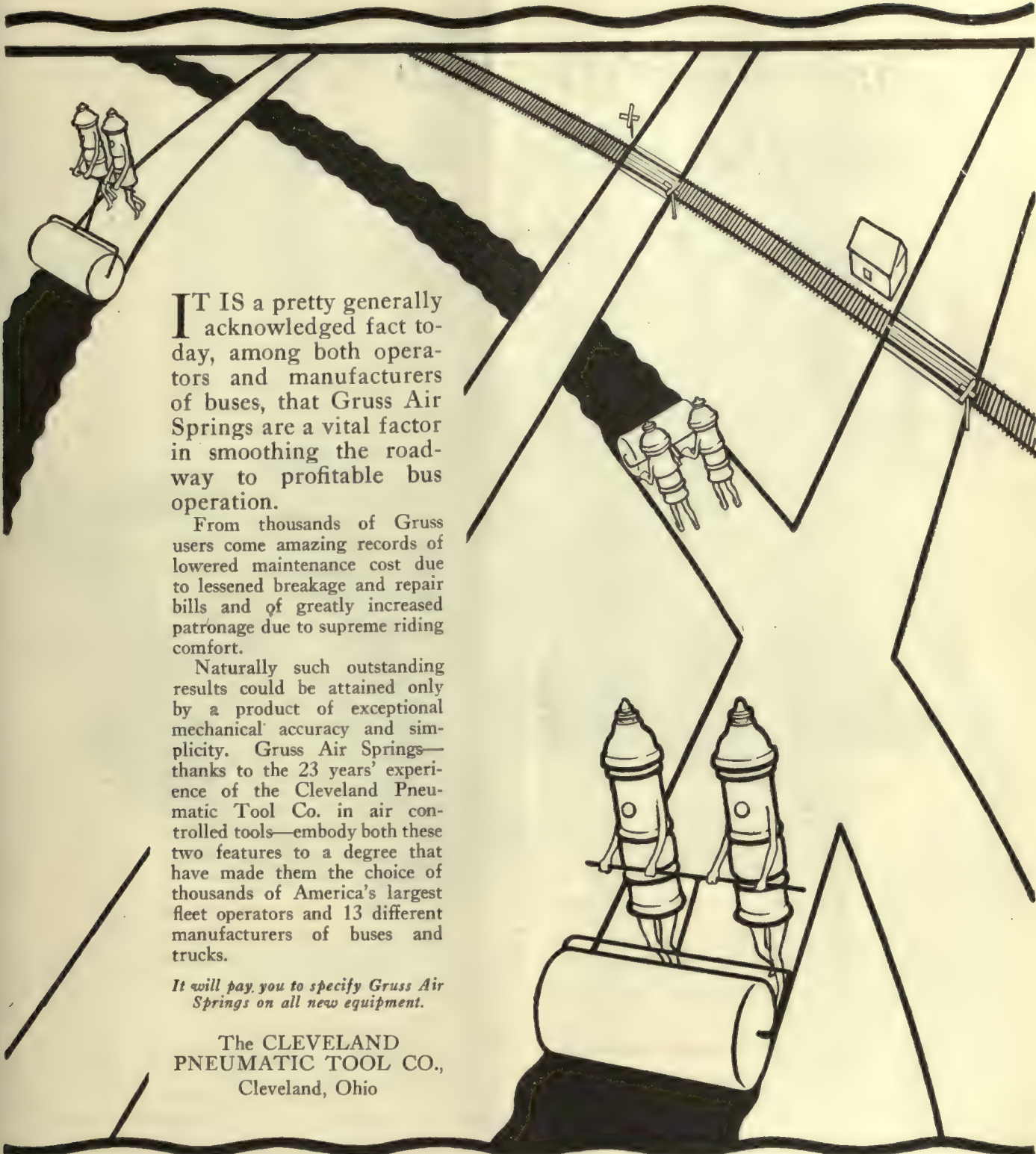
Convention Report Number

Dated October 9, 1926

*Write or wire for information on Electric Railway Journal's
Complete Convention Service*

ELECTRIC RAILWAY JOURNAL

Tenth Avenue at Thirty-Sixth Street
NEW YORK, N. Y.



IT IS a pretty generally acknowledged fact to-day, among both operators and manufacturers of buses, that Gruss Air Springs are a vital factor in smoothing the roadway to profitable bus operation.

From thousands of Gruss users come amazing records of lowered maintenance cost due to lessened breakage and repair bills and of greatly increased patronage due to supreme riding comfort.

Naturally such outstanding results could be attained only by a product of exceptional mechanical accuracy and simplicity. Gruss Air Springs—thanks to the 23 years' experience of the Cleveland Pneumatic Tool Co. in air controlled tools—embody both these two features to a degree that have made them the choice of thousands of America's largest fleet operators and 13 different manufacturers of buses and trucks.

It will pay you to specify Gruss Air Springs on all new equipment.

The CLEVELAND
PNEUMATIC TOOL CO.,
Cleveland, Ohio

GRUSS AIR SPRINGS

for Trucks, Buses
Passenger Cars ~



They couldn't understand why the battery lasted so long



A YEAR ago the Blue Bus Company, Covington, Ky. bought a bus equipped with Leece-Neville Electric Equipment. It had been operated 50,000 miles as a demonstrator. Up to the time our representative looked the job over recently, it had travelled a total of 110,000 miles. The original battery was in the car—had never been out for recharging—and tests showed it to be fully charged and in good condition.

Officials of the Blue Bus Company, couldn't understand why it had not been necessary to replace the battery at 25,000 mile intervals (every five or six months.)

Leece-Neville patented Voltage Regulation was the answer.

Battery makers take pains to tell you that the life of a battery depends on the treatment it receives.

Leece-Neville patented Voltage Regulation attacks two battery destroyers — overcharge and undercharge. It absolutely prevents overcharge and by permitting current output at low operating speeds, goes as far as possible in keeping the battery charged.

Everywhere, Leece-Neville Electrical Equipment is improving bus operation.

Our Service Book lists a service station near you where the details of Leece-Neville Electrical Equipment will be explained to you. If you do not have a copy, write for it.

The Leece-Neville Co.
CLEVELAND, OHIO



For cottage or mansion

THE increased demand for better lighting and a greater number of electrical conveniences in the American home, has created widespread interest in wiring details.

How easy then for the electrician to answer the question of safety and durability of a wiring job by the mere explanation—"It's Rome Code."

Contractors have long recognized

the in-built quality of Rome Code Wire just as thousands of industrial engineers depend upon other Rome Wires and Cables.

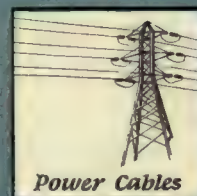
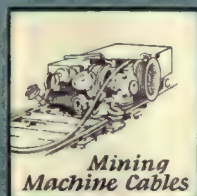
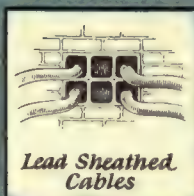
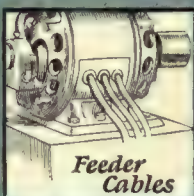
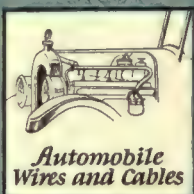
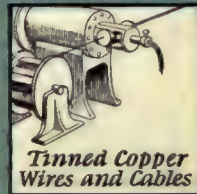
From the huge feeder cables to the smallest portable cords, the great variety of Rome Products are built to meet exacting requirements, in Rome Mills, under Rome supervision and inspection, from wire bar to finished copper wire.

Rome
Code
Wires

ROME WIRE COMPANY, ROME, N.Y.

ROME WIRE

FROM WIRE BAR TO FINISHED COPPER WIRE



TO many in the electrical industry all code wire is alike. But to the initiated, Rome Code Wire stands out as a better-than-standards product.

The reason for such a reputation is easily understood when you study the organization back of all Rome Wires and Cables.

Twenty years of manufacturing experience—an organization composed of men who have made a life-time study of the construction and use of all types of wire. Twenty acres of manufacturing floor space, all under one centralized control assures you of ample stock, quick shipments and competitive prices.

If you will let us know what wires and cables, shown on this page, you are interested in, we will be glad to send you samples, catalogs, and other information that will be of help to you—while an opportunity to quote on any of your wire requirements will always be welcome.



ROME WIRE COMPANY

Mills and Executive Offices: ROME, N.Y.

Diamond Branch: Buffalo, N.Y.

New York — 50 Church Street

Boston — 1011 Little Building

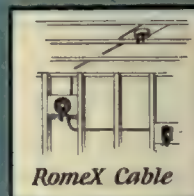
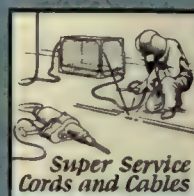
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Detroit — 25 Parsons Street

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Texaco Electric Car Oil

being applied to an armature bearing on a car
of the New York Railways Corporation, 146th
St. & Lenox Ave., New York City, N. Y.



TEXACO



The Chosen Lubricant
of ELECTRIC RAILWAYS



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

Southern Equipment Men Favor "Tool Steel" Gears and Pinions

At the Electric Railway Association of Equipment Men—Southern Properties—meeting at Mobile, February 26th, 1926, the question was asked—"What difference have member companies found in the life of gears and pinions? Tool Steel, ——"

(The names eliminated are competitive gears).

Note in the framing of the question, "Tool Steel" was put first. It always is.

Nine Equipment Men gave their experience, most of them very flattering to "Tool Steel," none of them finding any other gear superior.

What the man who does not use them says—

"The good reports that we got in Mobile will bear fruit, and it certainly gives us something to think of when it comes to the replacement of gears and pinions."

This is the effect the discussion had upon one of the Members who had not been using "Tool Steel" Gears.

The Tool Steel Gear & Pinion Company
Cincinnati, Ohio



The Standard of Quality

TOOL-STEEL QUALITY

GEARS AND PINIONS



Accidents

WHEN a valuable piece of machinery is destroyed or injured by accident, the superintendent wants to know who was to blame. He knows that few accidents can really be classed as "unavoidable." But when a machine is injured or temporarily rendered useless by the premature wearing out of a bearing, no investigation is made, as a rule. It is taken for granted that machinery must wear out. If it wears out sooner than it should, it's just bad luck—or if anybody is to blame, it is the maker of the machine.

Some day, perhaps, knowledge of the science of lubrication will be so general that the premature wearing out of machinery will be looked upon in its true light—as an accident which could easily have been avoided by the more careful selection of lubricants.

Meantime, plant superintendents who have familiarized themselves with this modern science are saving money for their companies by using the correct grades of

Standard Oils and Greases

Standard Oils and Greases are made in many grades to meet the lubrication requirements of every kind of machinery in use in modern industrial plants.

Our representative will recommend the grades of lubricants which will help to eliminate avoidable "accidents" of this kind in your plant.

STANDARD OIL COMPANY
(INDIANA)

910 South Michigan Avenue

Chicago, Illinois





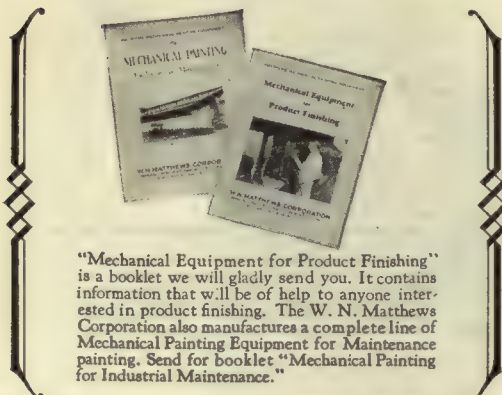
It Costs You Nothing to try this Superior Matthews Finishing Gun

Leading Paint, Oil Railroad and Automobile Companies Adopt the Matthews Gun

After thorough tests many industries have standardized on Matthews Mechanical Painting Equipment and Guns. This gun applies lacquers so wet, even and finely atomized that "orange peel" effects are not produced and the finish is much richer and more durable. The same gun is used for applying primer coats as well as finishing coats. Here are some additional reasons why users prefer the Matthews Gun:

- One nozzle and one sleeve for all operations.
- Quickly adjusted by turn of nozzle from spot the size of a dime to 12 inch fan stroke.
- Can be used on volume or jar feed.
- No splits or one sided strokes.
- Very fine atomization.
- Aluminum body—very light in weight—perfect balance.
- Clean-out valve on side, no clogging or costly interruptions.
- Greatly reduces time put in on rubbing coats.

A Book of Helpful Finishing Information



"Mechanical Equipment for Product Finishing" is a booklet we will gladly send you. It contains information that will be of help to anyone interested in product finishing. The W. N. Matthews Corporation also manufactures a complete line of Mechanical Painting Equipment for Maintenance painting. Send for booklet "Mechanical Painting for Industrial Maintenance."

14-MP

Maybe you are using some other gun and are fairly satisfied with it, or for some other reason you haven't had the opportunity to use one of the new Matthews Finisher's Guns, if such is the case don't put off using one of these guns any longer. We will be glad to send you one and let you be the judge. Hundreds of factories are discarding their formerly favorite guns for the new Matthews. Several of the leading paint manufacturers (names on request) after testing all others have adopted the Matthews Gun to demonstrate their surface coatings. At least try this gun and if you don't want to keep it you haven't bought anything.

How to Get Gun for Free Trial

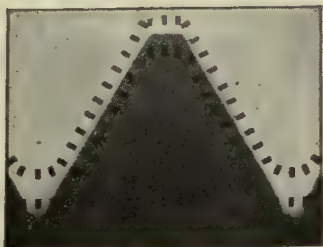
Just write on your business letter-head stating your title and we will send you a new Matthews Finisher's Gun immediately. If you are now using some other equipment please state make so we can send you an adapter with gun. This offer has no strings on it. If you like the gun you have acquired something that will cut your finishing costs and give finer richer finishes. If you don't like it return the gun and receive full credit.

W. N. MATTHEWS CORPORATION
3772 Forest Park Blvd. St. Louis, U. S. A.

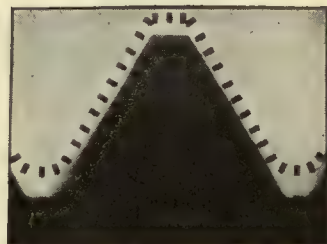
MATTHEWS MECHANICAL PAINTING EQUIPMENT

MANUFACTURERS OF INDUSTRIAL EQUIPMENT
SINCE 1899

EMPIRE BOLTS & NUTS



Comparator photograph showing profile of thread of a hardened and ground gauge.



Comparator photograph showing profile of thread of an Empire New Process Bolt.

Bolt Threads That Rival the Gauge

The thread of an Empire New Process Bolt has the close fit of a hardened and ground gauge, as proved by the infallible evidence of the Comparator photographs shown above. It has *six times the accuracy of the ordinary bolt thread.*

And 20% greater strength. For the New Process dies which form the thread on this remarkable bolt *mould* the thread as a modeler moulds his clay—the granular composition of the metal is made stronger and more compact

under the pressure of the dies. That is why the thread of an Empire New Process Bolt *does not strip!* Samples for testing these statements will be furnished free.

RUSSELL, BURDSALL & WARD
◎ BOLT & NUT COMPANY ◎
 PORT CHESTER, N.Y.

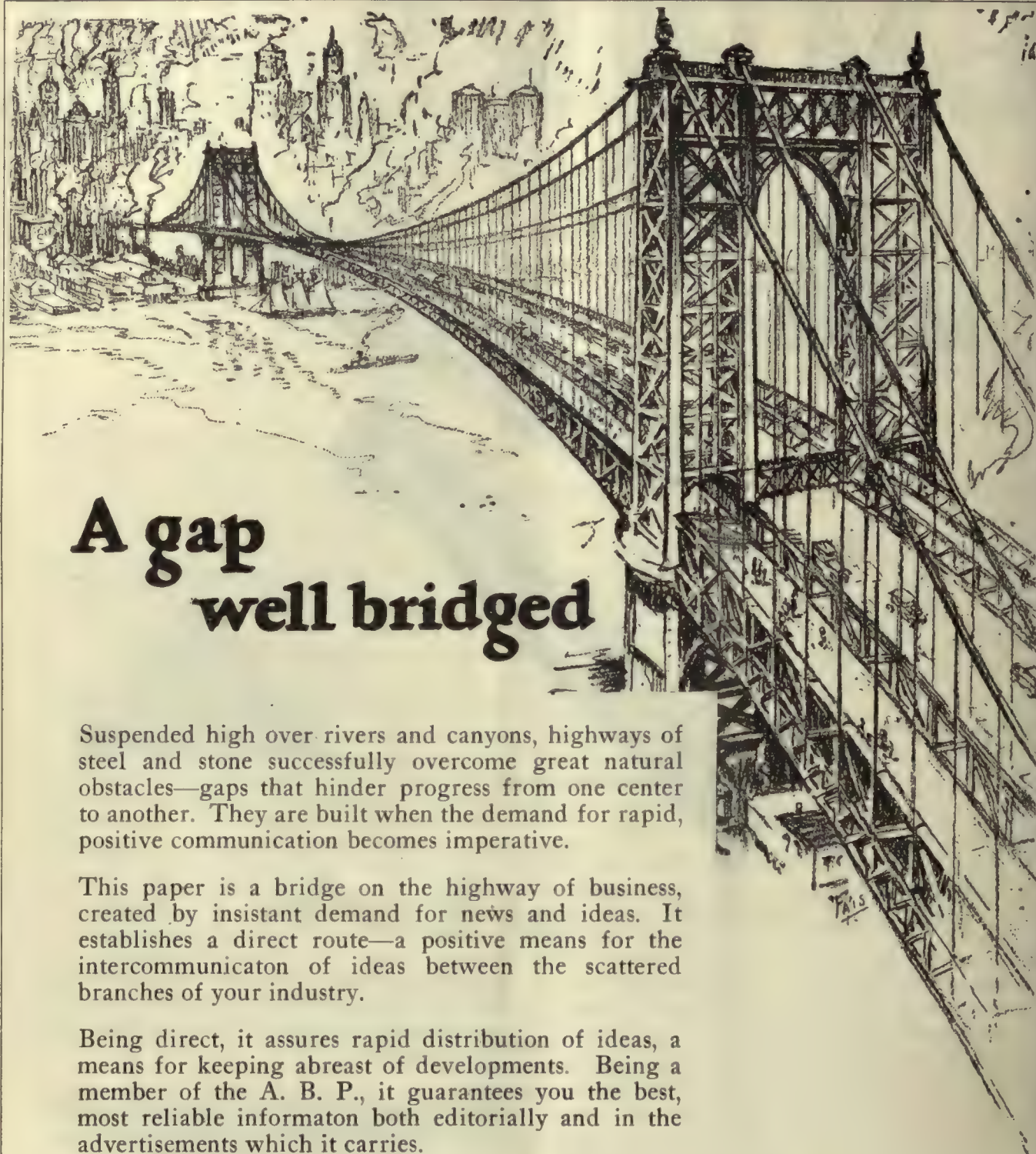
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Makers of Bolts, Nuts and Rivets Since 1895

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This paper is a bridge on the highway of business, created by insistant demand for news and ideas. It establishes a direct route—a positive means for the intercommunicaton of ideas between the scattered branches of your industry.

Being direct, it assures rapid distribution of ideas, a means for keeping abreast of developments. Being a member of the A. B. P., it guarantees you the best, most reliable informaton both editorially and in the advertisements which it carries.

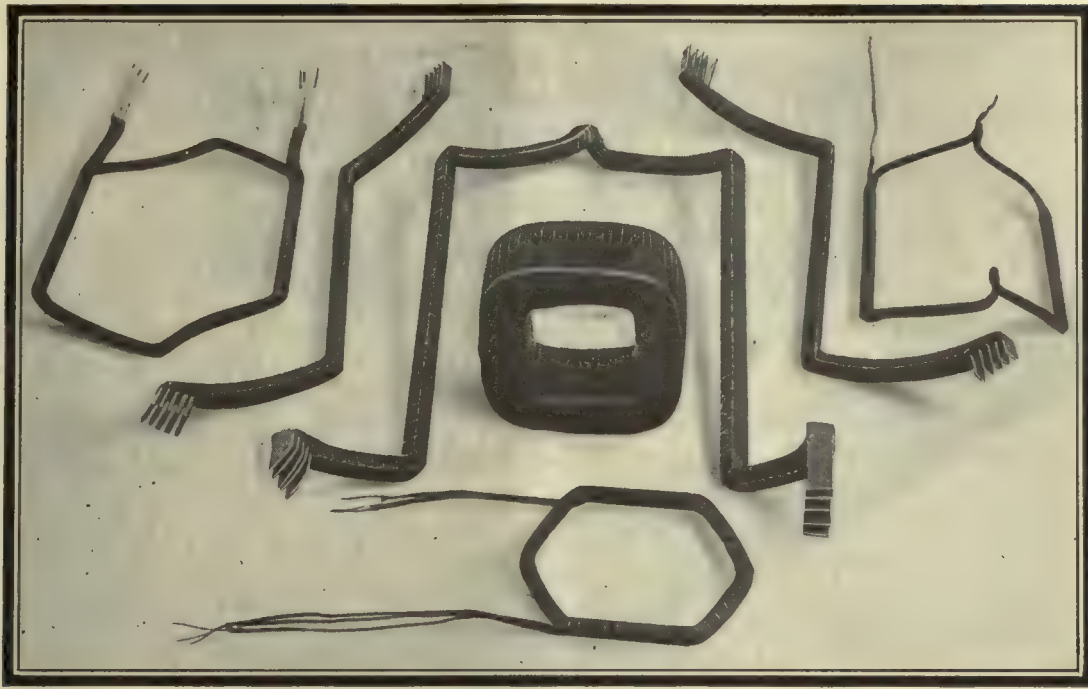
Take the shortest and best route to up-to-the-minute news. This A. B. P. paper leaves no gap in supplying information which is helpful to you in the conduct of your business.

THE ASSOCIATED BUSINESS PAPERS, Inc.
Executive Offices: 220 West 42nd St., New York, N. Y.

A. B. P.

An association of none but qualifed publications reaching the principal fields of trade and industry.

The Electric Railway Journal is a member of The A. B. P.



It's a Comfort to Find Coils

that are moulded or pressed to accurately fit the slot dimensions. The forcing of a coil into its slot may break the insulation and cause trouble on the road.

Columbia Coils are not only accurately formed to slot dimensions but are built up from the highest grade materials and reinforced in insulation at all points where trouble is most likely to develop.

The danger of shorting, therefore, is reduced to a minimum while Columbia manufacturing methods have been so fully standardized and simplified that you are likely to find an advantage in price as well as in quality.

We will be glad to quote you on Columbia Field and Armature Coils which, unless otherwise specified, are standard and interchangeable. We will also be glad to quote you on any of our other products. Our shops are yours to command.



The

COLUMBIA MACHINE WORKS

and Malleable Iron Company

Chestnut St. and Atlantic Ave.

Brooklyn, N. Y.



For the Best in
Track Work

Forty-five years
experience and
the best of mod-
ern facilities.

*Send Us
Your
Inquiries*

THE BUDA CO.
Harvey, Ill.

It Is Everybody's Duty To Prevent Accidents

You can solve this problem by using

H-B LIFE GUARDS

They Protect Lives and Save Damage Claims

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THE CONSOLIDATED CAR FENDER COMPANY
PROVIDENCE, R. I.

Wendell & MacDuffie Co., General Sales Agents, 110 East 42nd St., New York, N. Y.

What Nuttall BP Gears can do for you in the Repair Shop



Nuttall Helical
Gear Set

They reduce Loss of Operating Time

A broken gear on a machine means that operations stop until another gear can be gotten. Worn gears result in loss of production while replacements are made. BP gears will cut down these losses because replacements will be less frequent.

R.D. NUTTALL COMPANY
PITTSBURGH  PENNSYLVANIA



All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.



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The symbol dated transfer is the safest and most economical.

Unused transfers can be turned back into stock at the end of the day, and used again.

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If it's a ticket or check—we make it.

Globe Ticket Company 116 N. 12th St. Philadelphia, Pa.

Specialists in Tickets and Checks Since 1873 Los Angeles New York San Francisco





A hard, dense type of brush

That type of U. S. G. Brush is giving excellent service in the electric railway field—clean commutation and long life with minimum labor attention.

Electrical power losses are reduced by their use, and the life of commutators substantially increased. The lubricating qualities of the graphite used in their composition lessen the wear on both the commutator and the brushes.

Our experienced brush engineers will gladly study your conditions and recommend the type of U. S. G. brush best adapted to your needs. Communicate with our nearest office.



**Brushes
fill the bill**

Manufactured by

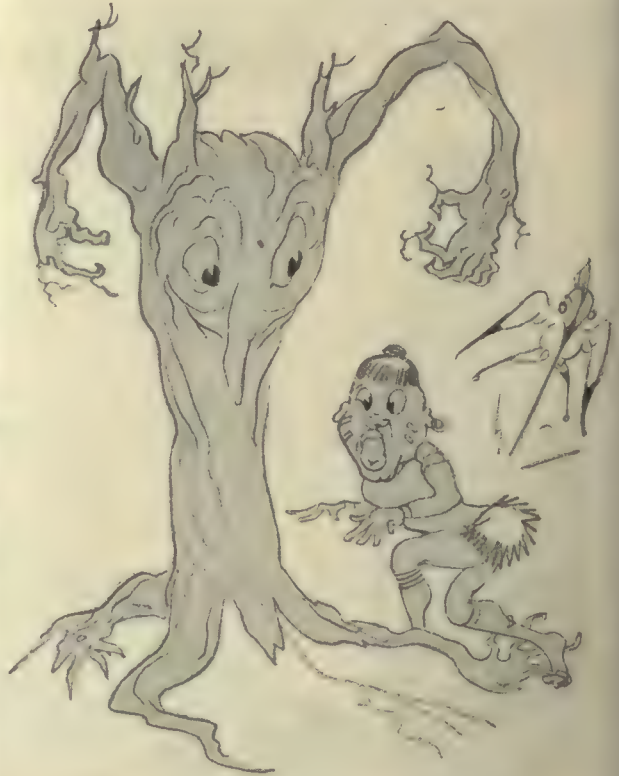
The United States Graphite Co.

Saginaw, Michigan

New York
Chicago

Philadelphia
St. Louis

Pittsburgh
San Francisco



IZI GEBENGENI

It is generally well-known that the Honey Bird of the Kaffir country leads the native to the spot where there is a fine juicy beehive.

But on the other hand it is said that if the bird takes a dislike to you he'll lead you to Izi Gebengeni, the wood goblin—and that isn't so good.

It never pays to place too much dependence on what looks like a sure thing.

Just because a carbon brush fits well into a machine and operates with honey sweetness is no sign that your brush troubles are ended, for it may be leading you to the high-yearly-cost goblin.

- unless, of course, that brush is a Morganite
- in which case you're safe
- for a Morganite never takes a dislike to anyone
- it's well bred.

Morganite

Brush Co., Inc.

Main Office and Factory

519 West 39th St., New York

DISTRICT ENGINEERS AND AGENTS

Pittsburgh, Electrical Engineering & Mfg. Co., 909 Penn Ave.

Cincinnati, Electrical Engineering & Mfg. Co., 607 Mercantile Library Building.

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Toronto, Can., Railway & Power Engineering Corp., Ltd., 101 Eastern Ave.

Montreal, Can., Railway & Power Engineering Corp., Ltd., 326 Craig St., West.

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*Do you rebuild a car
only to extend its life?*

WHEN a car is shopped for general overhauling or reconstruction do you merely try to put additional life in the old frame? Is it a question solely of maximum years service at minimum material and labor cost?

Or do you take advantage of the opportunity to modernize the car—make it a credit to the company and an economical producer of transportation?

One of the important considerations in making rebuilt cars measure up to pres-

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The successful operator today is not only extending the life of rebuilt cars—he is making them modern. We will gladly send blueprint booklets on HASKELITE and PLYMETL showing how these materials will help in that process.

HASKELITE MANUFACTURING CORPORATION

133 W. Washington Street, Chicago, Ill.

The Public Service Co. of New Jersey and many others order these products for reconstruction work.

ERJ8-21-Gray

You're having brush trouble

CORRECT IT

USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron

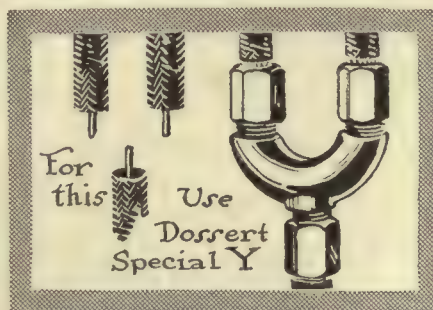
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O.K. on This Y

Engineers have placed their O.K. on the Dossert Tapered Sleeve principle of Solderless Connection. This principle obtains in the complete line of Dosserts.

And the 20th Year Book illustrates the complete line. Write for a copy.



FREE

Dossert & Co.

242 West 41st Street
New York, N. Y.

The 1926 Edition McGRAW Electric Railway Directory

The time your salesmen can
save would pay for it
many times

"Who are the men I should talk to in the Blank Railway Company?"

You'll find the answer quickly in the 1926 Edition McGraw Electric Railway Directory. Keep a copy handy—in your desk, in your brief case. You'll need it. Call on the right men—the men who specify or buy. If your salesmen cover wide territories, they can't be expected to know all the changes in personnel of the roads they call on.

Our records showed 65% in changes since our 1925 Edition was published.

And your mailing list. Why not *know* in advance that you are reaching the men you *need* to reach. Build and check your mailing lists from the McGraw Electric Railway Directory.

Don't waste valuable time and effort in a \$300,000,000 market by misdirecting your sales program. Save both by returning the attached coupon.

Here are the inside facts

- 1—Complete list of every recorded electric railway company in the United States, Canada, Mexico and the West Indies.
- 2—Names and addresses of officials, superintendents, department heads and purchasing agents, corrected to date of report.
- 3—Addresses of companies operating buses.
- 4—Addresses of repair shops.
- 5—Mileage of track and bus routes.
- 6—Number and kinds of cars used.
- 7—Rates of fare.
- 8—Amusement parks owned or reached.

Price \$7.50 a Copy

10% discount for five or more

DIRECTORY DEPARTMENT, ELECTRIC RAILWAY JOURNAL,
10th Ave. and 36th St., New York, N. Y.
Gentlemen:—Will you please send me:

.....copies of 1926 McGraw Electric Railway Directory, check
for \$.....enclosed.

.....More complete information concerning contents.

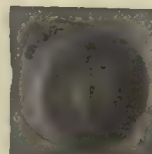
Name

Company

Street

City State.....

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Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

Earll Catchers and Retrievers

C. I. EARLL, York, Pa.

Canadian Agents:

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ELECTRICAL INSULATION

MICANITE and EMPIRE
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Micanite Sheets for all purposes

Micanite Commutator Segments

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Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias
(Yellow or Black Varnished Tapes)

Empire Oiled Cloths and Papers
(Yellow or Black)

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Write for Catalogs and helpful booklet
on Commutator Insulation and Assembly

MICA INSULATOR COMPANY
New York: Chicago:
68 Church St. 542 So. Dearborn St.
Works: Schenectady, N. Y.

Tribloc Chain Hoists



*Lift a load
off the fare box*

Large railroads and public utilities do not purchase Tribloc Chain Hoists merely because they have a "well-groomed" appearance—it is their performance under the shocks and strains of shop work that has won the recognition of these buyers.

You, too, can know the benefits of using the right size and type of Ford Chain Hoist. All we ask is a brief description of the job—we shall be glad to tell you why and how some type of Ford Hoist can pay its way in your shop and "lift a load off the fare box." Send for Catalog 7-B.

FORD CHAIN BLOCK COMPANY
2nd and Diamond Sts., Philadelphia, Penna.

We also manufacture "THE MOTORBLOC"
an electrically driven chain hoist.

PANTASOTE

Trade Mark

Seat and Curtain Materials

There is no substitute for Pantasote

AGASOTE

Trade Mark

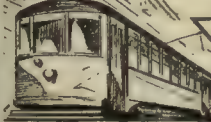
Roofing—Headlining—Wainscoting

The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th 250 Park Avenue Street
NEW YORK



Pantasote Products
for Both
ELECTRIC RAILWAYS
AND
BUSES



AIR POWER FOR THE SHOP

Rising costs of labor in manufacture must be met, by more extended use of mechanical methods, to keep earnings at a dividend-paying level.

Use more air tools and run them with more economical air compressors.

You can cut your air power cost by using

Sullivan Angle Compound AIR COMPRESSORS

With them you will:—

Save floor and building area.

Save foundation cost.

Save installation expense.

Save horsepower per unit of air delivered at any load.

Save operator's time and labor.

Save repairs.

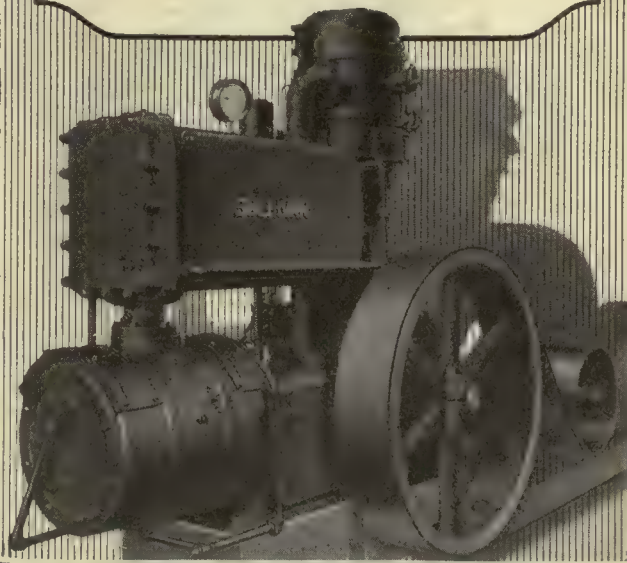
Save overhead cost.

Sullivan Angle Compound balanced design enables these machines to run without perceptible vibration, hence smaller foundations and higher rotative speeds are permissible. Wafer air valves throughout, and three pass counter-current copper inter-coolers assure high volumetric efficiency.

The Sullivan automatic load and capacity control proportions the power used exactly to the work done.

Single units to 1,800 cu. ft.; twin units to 3,700 cu. ft.

Ask for Catalogue No. 3277-H



SULLIVAN
TRADE MARK
MACHINERY COMPANY
150 S. Michigan Ave. Chicago



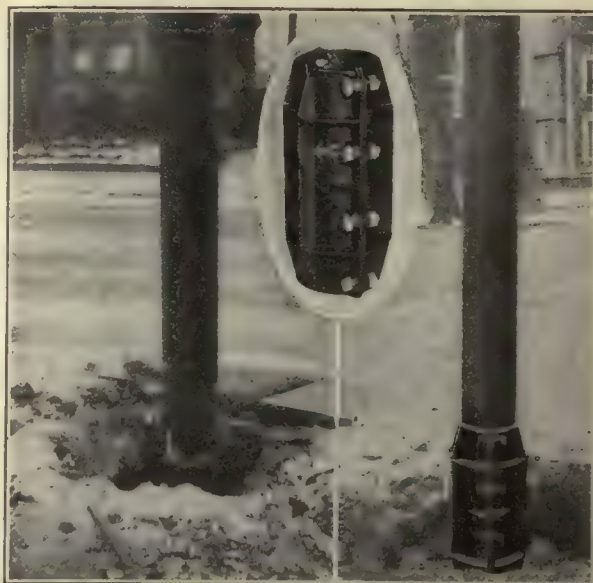
Strombos Signals for Railway Service

A pleasing sound of tremendous volume is emitted from the powerful Strombos Signal which is admirably suited for railway service. Day in, day out, it broadcasts a warning of approaching danger and promotes safe and efficient railway operation.

The Strombos Signal operates on an air pressure of 10 lbs. and over and is controlled by a lever valve and cord. It uses only 1/10 the volume of air required by a whistle. It has no moving parts which might fail in the emergency.

Write us for more complete data.

AMERICAN STROMBOS CO.
INCORPORATED
18th & Market Sts., Philadelphia, Pa.



Clark-Williams Tubular Iron Pole Reinforcing and Extension Clamps

Years can be added to the life of any iron pole which has become corroded at the ground level with our REINFORCING CLAMPS, or added height may be obtained by using the EXTENSION CLAMPS.

ALSO MOUNTS FOR WOOD POLES.

Ask for quotations on your requirements.

The Clark-Williams Engr. Co.
886 Main St., Bridgeport, Conn.



Drip Points for Added Efficiency

They prevent creeping moisture and quickly drain the petticoat in wet weather, keeping the inner area dry.

The Above Insulator—No. 72—Voltages—Test—Dry 64,000 Wet 31,400, Line 10,000.

Our engineers are always ready to help you on your glass insulator problem. Write for catalog.

Hemingray Glass Company
Muncie, Ind.
Est. 1848—Inc. 1870

Business Wants

THE *Searchlight* Section of this paper represents a meeting place for men and concerns who have immediate business "wants" to fill—the section covers

Agencies Wanted
Agents Wanted
Books and Periodicals
Business Opportunities
Civil Service Opportunities
Contracts Wanted
Desk Room for Rent or Wanted
Educational
Employment Agencies
Employment Service
Foreign Business
For Exchange
For Rent
For Sale
Franchises
Labor Bureaus
Miscellaneous Wants

New Industries Wanted
Office Space for Rent or Wanted
Partners Wanted
Patent Attorneys
Patents for Sale
Plants for Sale
Positions Vacant
Positions Wanted
Property for Sale
Representatives Wanted
Salesmen Available
Salesmen Wanted
Spare Time Work Wanted
Sub-Contracts Wanted
Tutoring
Vacation Work Wanted
Work Wanted

"SEARCHLIGHT"

Change a wheel? Change a harp?
Change a pole?



Quick!
Yes,
quick as changing a lamp in
a socket

A sudden storm—out with the sleet cutters! Two or three motormen report trolleys needing overhaul!

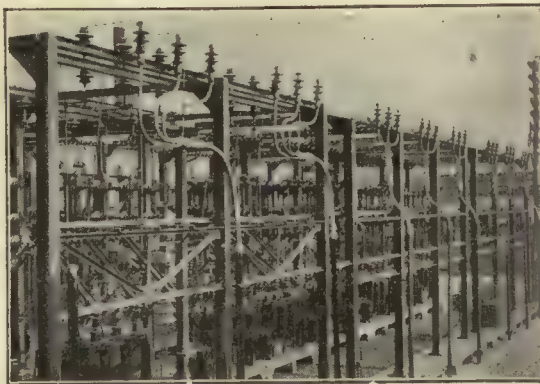
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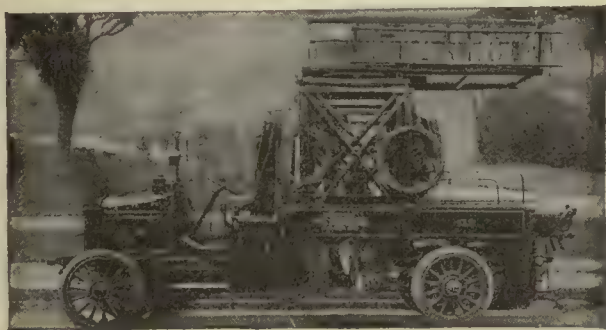
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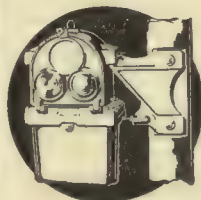
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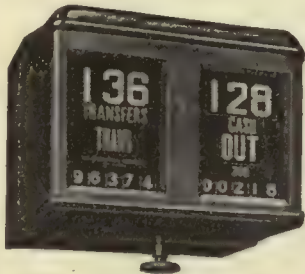
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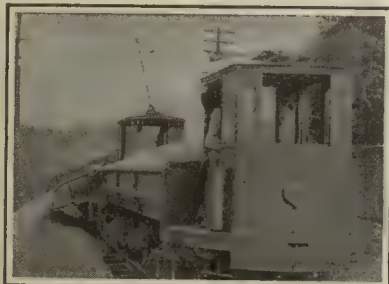
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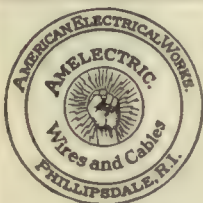
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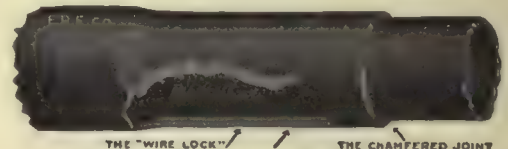
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DEPARTMENT OF CITY TRANSIT
CITY OF PHILADELPHIA
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Philadelphia, August 16, 1926.

Sealed proposals, addressed to the undersigned, at the office above mentioned, will be received until 11 o'clock a.m. (Eastern Standard Time), on Friday, September 10, 1926, and publicly opened immediately thereafter, for laying track in the Broad Street Subway, the Fern Rock Terminal Yard, and the Shops in the yard.

Plans and specifications may be seen at the office of the Department on the 12th floor, 1211 Chestnut Street, and copies of the same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of Fifty (50) dollars will be required for the plans and specifications. This deposit will be refunded upon return of the plans and specifications in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accompanied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia, to the amount of five (5) per centum of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

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International Steel Tie Co.

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Wm. Wharton, Jr. & Co., Inc.

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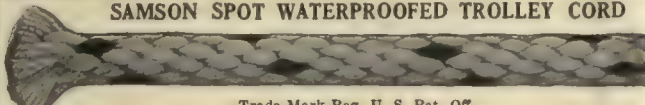


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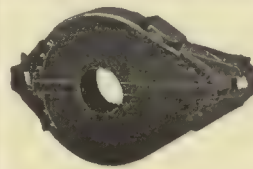
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is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we build. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut

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"Builders of Financial Stability"



NEW CARS—

Operating Costs OLD CARS

Jan.—Feb.—March
1925

	Per Car Mile
Way and Structures...	4.10c.
Equipment	8.11c.
Power	8.80c.
Conducting Transportation	13.06c.
General and Misc.....	3.52c.
Total	37.59c.

Operating Costs NEW CARS

Sept.—Oct.—Nov.
1925

	Per Car Mile
Way and Structures...	2.38c.
Equipment	3.14c.
Power	5.43c.
Conducting Transportation	9.02c.
General and Misc.....	5.93c.
Total	25.90c.
Annual saving	\$54,812
Investment	84,000
Gross return	65%

*Interstate Street Railway, Attleboro, Mass.
introduces modern cars with remarkable success.*

Displacing its 45,000 lb. double-truck cars with five new 31,000 lb. 44-passenger and three new 16,000 lb. 32-passenger one-man operated cars, all Wason built, this New England property not only has reduced its operating cost sufficiently

to effect an annual saving equal to 65 per cent of the capital invested in the new equipment, but in addition the month of March, 1926, showed an increase of 17 per cent in passenger revenue.



THE J. G. BRILL COMPANY
PHILADELPHIA, PA.



AMERICAN CAR CO.
ST. LOUIS, MO.

G.C. KUHLMAN CAR CO.
CLEVELAND, OHIO.

WASON MAN'G CO.
SPRINGFIELD, MASS.

Of all the phases of modernization, increased schedule speed has the most far-reaching effect on earnings. It boosts your "production" per man-hour, and thereby reduces operating cost per car-mile. Most important of all, it sells more service.



Do modern cars increase schedule speed?

Here are reports from six roads. Each has improved its schedules during recent years. In each case modern cars were necessary. General Electric car equipment is used on every road.

"New equipment was necessary to maintain the increased schedule speeds in most cases."

LEVIS (P. Q.) TRAMWAYS CO.

"New light-weight cars, weight 32,000 pounds using GE-258 Motors, have been purchased and these accelerate much faster than the older, heavy type of car."

MORRIS COUNTY (N. J.) TRACTION CO.

"Schedule speeds increased by a gradual cut in running time; also through new equipment affording better acceleration."

NEW ORLEANS (LA.) PUBLIC SERVICE, INC.

"Schedule speeds slightly increased. By reducing stand time; also by the use of new equipment."

BIRMINGHAM (ALA.) ELECTRIC CO.

"Our schedule speed has been increased. Made possible by better track conditions; improvements in equipment such as light-weight all-steel construction and improvements in the motor design which give the car a faster acceleration and running speed; giving more attention to schedule maintenance and construction; a more thorough study of traffic conditions."

SAN ANTONIO (TEX.) PUBLIC SERVICE COMPANY



The resources and the service of the entire G-E organization are available to consider the problems of modernization and co-ordination—to find the most effective means of transportation and to build appropriate equipment.

"Schedule speed increased from 8 miles to 9.2 miles an hour. This was accomplished by making a survey and finding every possible place where the speed could be increased, and also by using new equipment in the form of safety cars with a quick pick up and by eliminating all unnecessary lagging."

WISCONSIN POWER & LIGHT CO.

GENERAL ELECTRIC

ELECTRIC RAILWAY JOURNAL

Effective Tire Economy

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"Lowest possible cost per tire mile" is more than an aim. It is an absolute necessity for profitable operation.

The Royal Cord Motorcoach Tire meets the most severe tests of actual operating conditions. Its performance has been carefully checked on the road in every section of the country.

These tests have clearly demonstrated that the tire is right. Right in design. Right in construction. Right in its ability to deliver long, trouble-free mileage on the great coaches of today.

It cuts tire expense. It saves mechanical repairs. It prevents costly delays. It is *truly economical*.

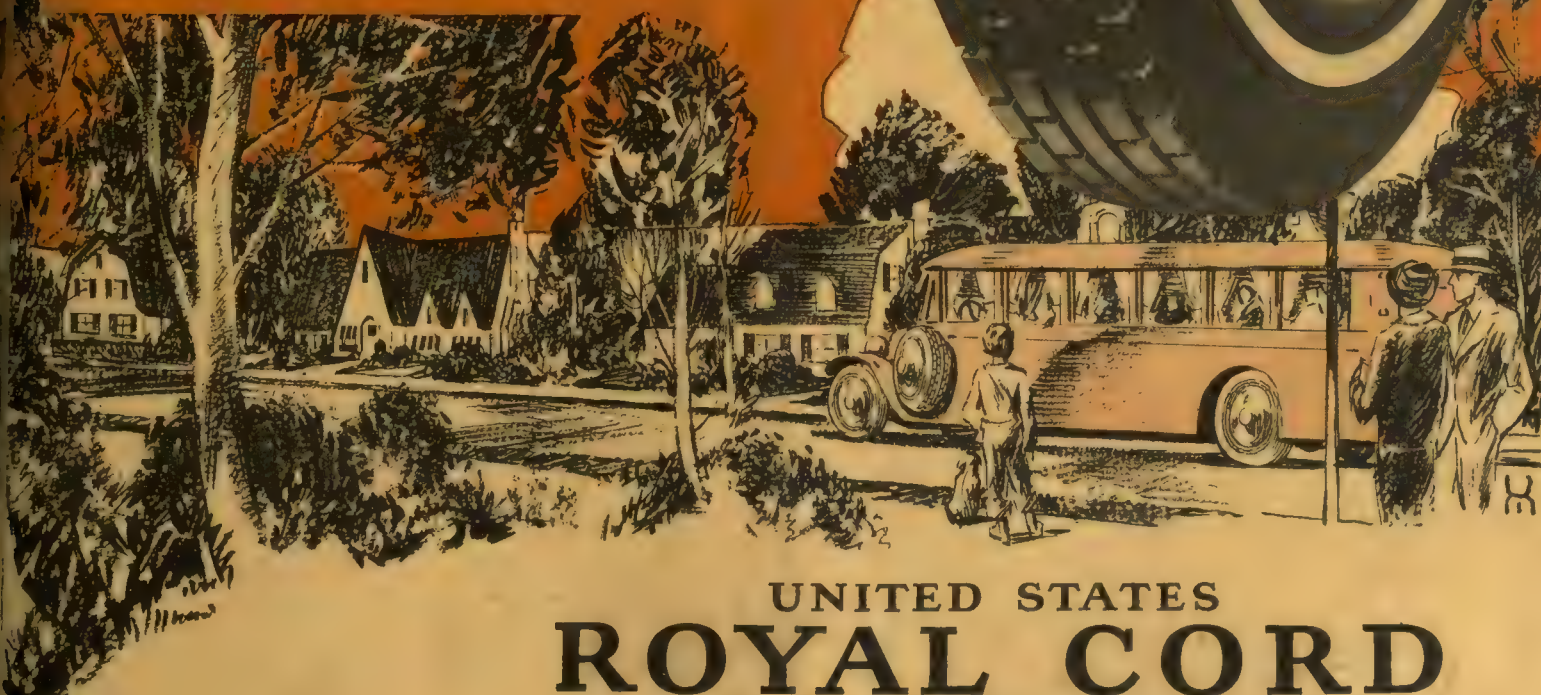
United States



Trade

Rubber Company

Mark



UNITED STATES
ROYAL CORD
Motorcoach

UNITED STATES TIRES ARE GOOD TIRES

In July, 1886, this photograph was taken on Washington St., Binghamton, N. Y.—on the first line in New York State to operate electric cars.



In Binghamton *Forty Years of Transportation Progress*

FORTY years ago this little open car began regular trips on the streets of Binghamton, N. Y. Strange as it may look today, in that day it represented modern transportation—for Binghamton was the first city in the Empire State to use electric cars.

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East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of
the United States and Foreign Countries



1926

Westinghouse

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Dependable Westinghouse equipment has contributed much to good trolley service in Binghamton. The present standard cars of the Binghamton Railway Company are equipped with Westinghouse motors and HL control. These are thoroughly modern steel cars, each providing seats for 42 passengers.

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Vol. 68
No. 9

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Looking Ahead

ONE of the most important functions of ELECTRIC RAILWAY JOURNAL is to help its readers to look ahead. Following as it does the developments in its industry from week to week throughout the civilized world it is in a position to interpret in the broadest sense any local situation that may have a general significance.

To this purpose the editorial pages of the paper are devoted. From week to week the industry's attention is directed to practices and tendencies which indicate the direction of development.

From that point, the JOURNAL goes a step further. It acts as counsellor and friendly critic. It endeavors to point ahead along the road of progress. It cautions its industry against practices that, though apparently expedient, endanger sound development. It takes a firm stand in advocating and urging measures which it believes are in the interest of fundamental progress.

Looking back through the JOURNAL's editorial pages in the light of present knowledge gives impressive evidence of its influence in the industry and the soundness of its counsel.

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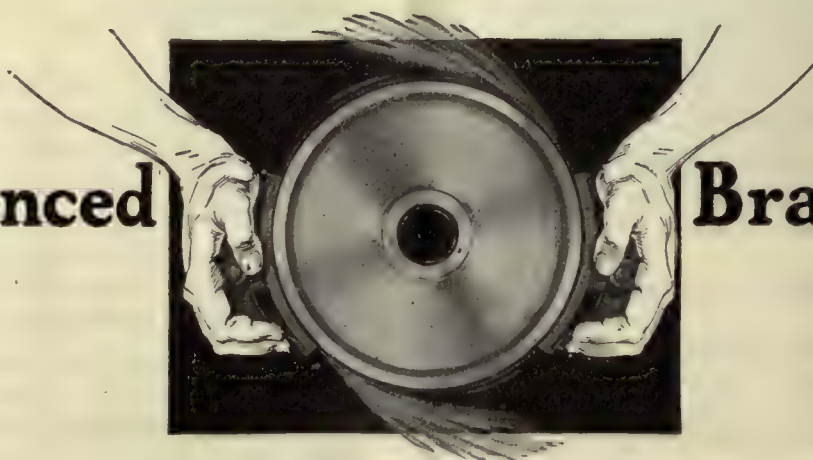


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Double it—and you decrease over 50% the required energy absorption per brake shoe.

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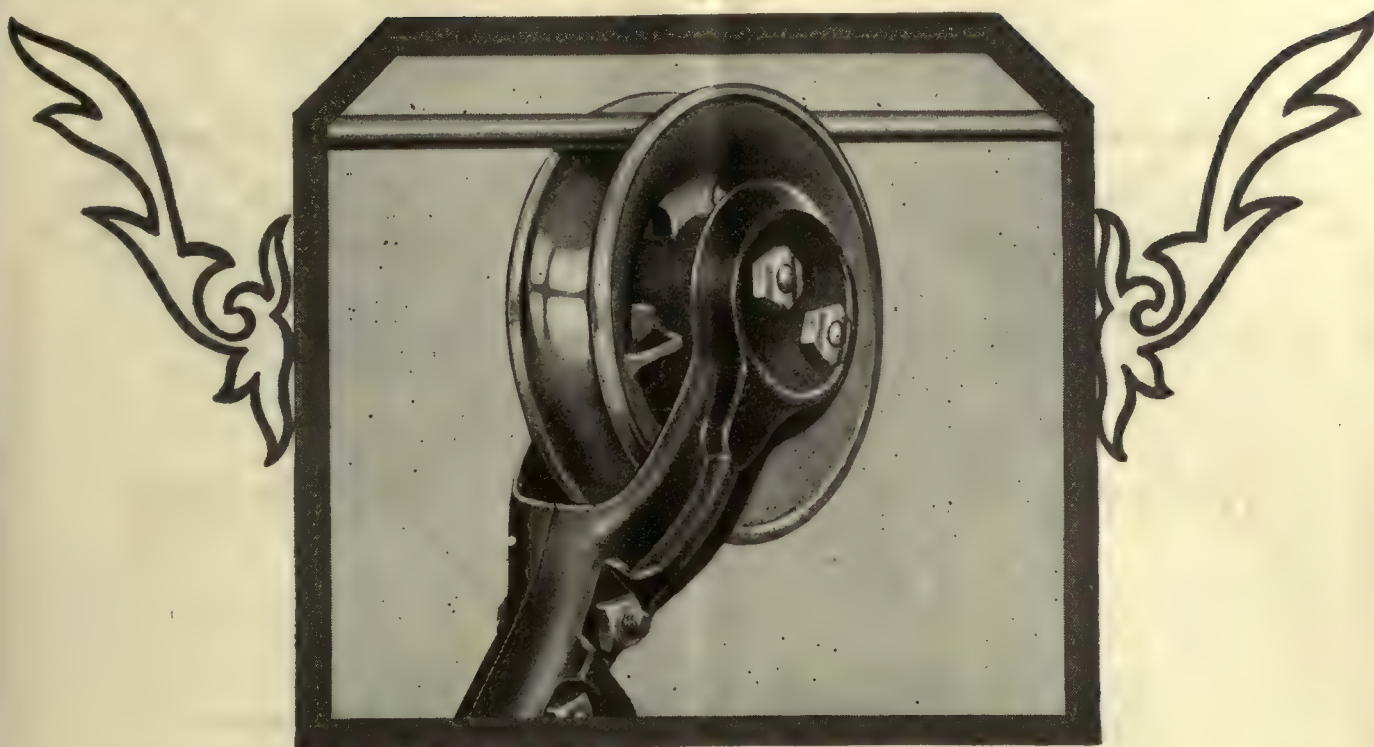
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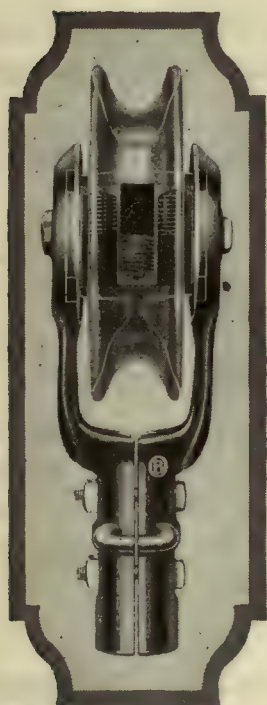
ST. LOUIS

American Multiple Unit Clasp Brake





Runs 18,000 Miles Plus—With Less Wear on Overhead—No Upkeep



Phantom View
OB Wheel and Harp

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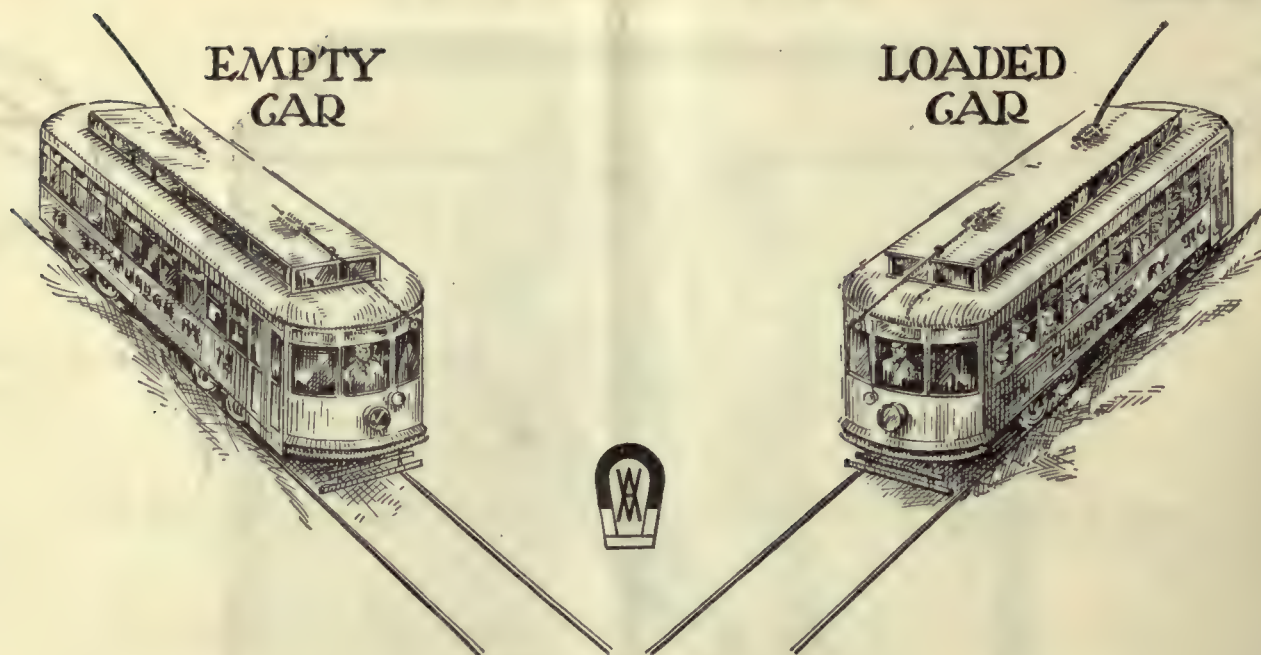
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144C

Ohio Brass Co.



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INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
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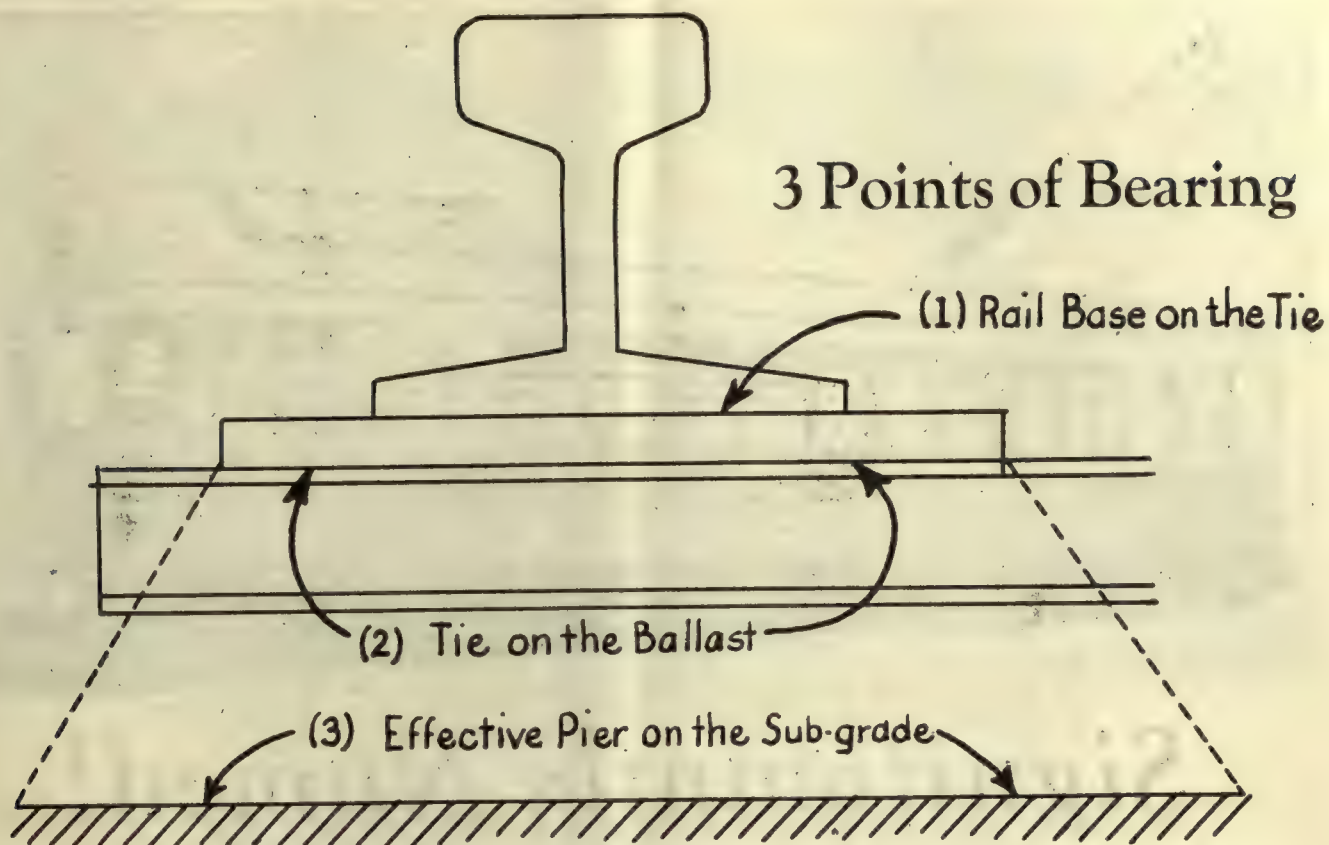
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(2) Tie on the Ballast	936
(3) Effective Pier on the Sub-grade	2700

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Steel Twin Tie Track



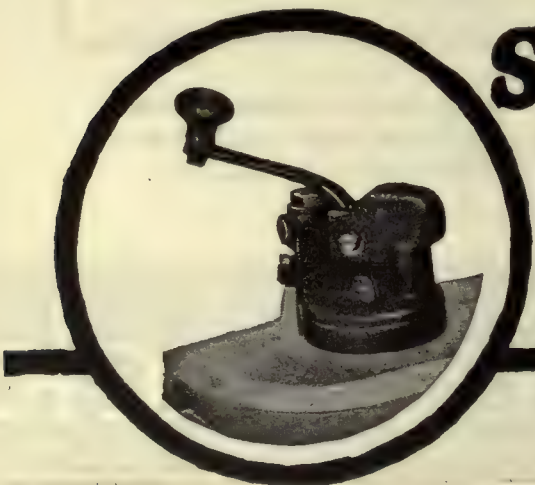
Significantly Named!

The ten high class interurban cars recently put into service by the Georgia Railway and Power Company on their Marietta and Stone Mountain lines were named, by popular vote of patrons, to memorialize citizens who had been outstanding in the development of the territory served by the two lines.

By nature these cars have another distinctive name common to them all; they are called SAFETY CARS. Their character corresponds to that stipulated by the A.E.R.A. definition: "Any car equipped with adequate safety devices for one-man operation."

We make the Safety Car
Control Equipment
which makes the Safety
Car.

Safety Car Control Equipment interlocks the power, brake, and door control functions to combine ease and convenience for centralized operating responsibility, while providing assurance of adequate safety.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.

Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH



Added attractiveness obtained with de luxe type lighting fixtures

In days gone by an electric railway car was merely a car—a conveyance in which people rode because there was no alternative.

Nowadays, competition has educated people to select a conveyance that not only gets them somewhere but is also attractive.

To help improve the appearance of electric railway cars the newly designed *Dome Type* Safety Car Lighting Fixtures give a luxurious Pullman effect.

These fixtures have beautiful Druid glass bowls which produce a soft, pleasing well-diffused light. Substantially made to withstand extreme vibration, these fixtures use 94 watt lamps and compensated circuit.

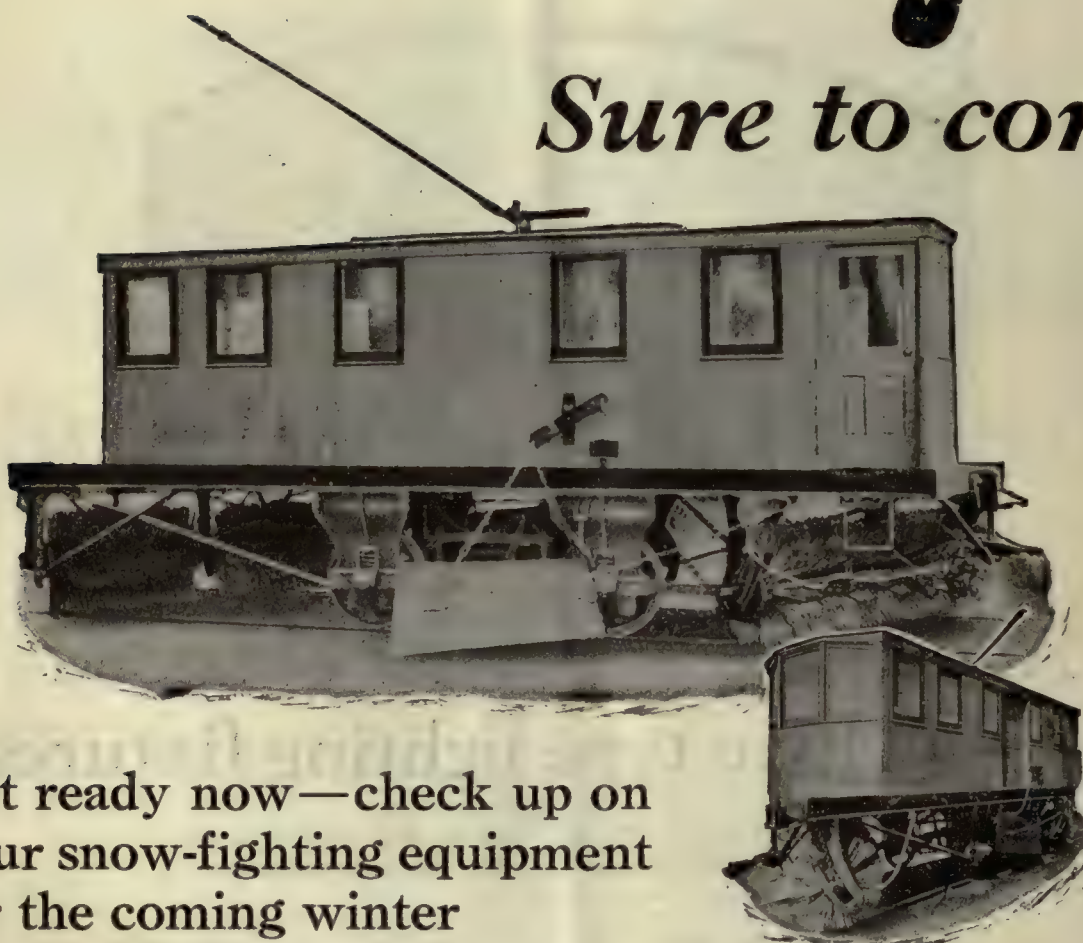
Full particulars gladly sent on request

ELECTRIC SERVICE SUPPLIES Co.

PHILADELPHIA	NEW YORK	CHICAGO
17th and Cambria Sts.	50 Church St.	Illinois Merchants' Bank Bldg.
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		DETROIT
		General Motors Building
Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver		

SNOW!

Sure to come!



Get ready now—check up on your snow-fighting equipment for the coming winter

The standard single truck, steel underframe, long-broom sweeper is exceptionally strong and rigidly built, handling deep snow rapidly without stalling. The long broom clears both rails and fifteen inches additional on the outside of each track. These sweepers are equipped with case-hardened roller bar detachable-link steel chains of 28,000 lbs. tensile strength.

McGuire-Cummings Single and Double Truck Snow Sweepers and Plows are "Standard Equipment" on practically every Electric Street Railway Line in the United States and Canada that has snow to contend with.

CUMMINGS CAR AND COACH COMPANY

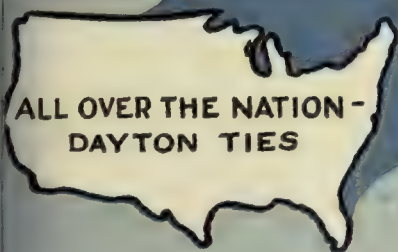
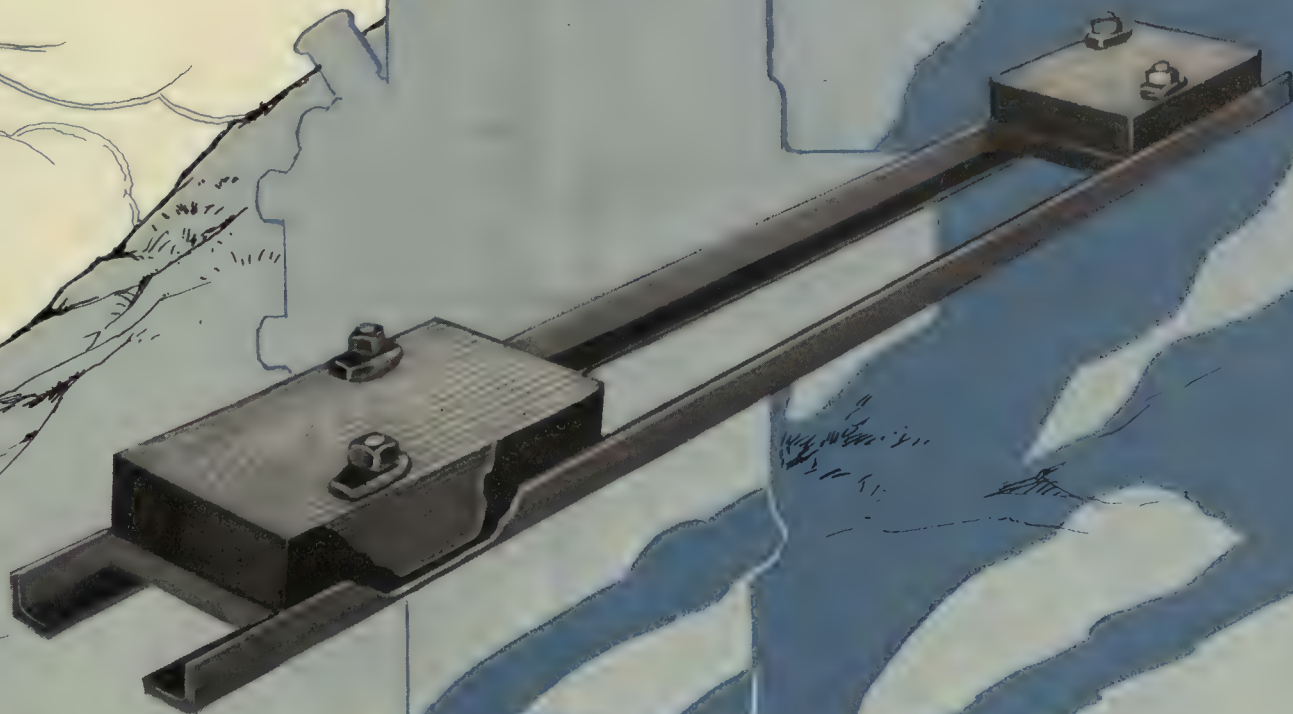
Successors to McGuire-Cummings Mfg. Co.

111 W. Monroe St., Chicago, Ill.

Light Weight City and Interurban Cars

Single and Double Truck Snow Sweepers and Plows

Shock Absorber Track With Dayton Mechanical Ties



**The Dayton
Mechanical Tie Co.**
DAYTON, OHIO

Shock Absorber Track With Dayton Mechanical Ties

THE WEARING QUALITIES of track depend not so much on the rail, but on that which holds the rail up.

Sleeper or ballast must have resiliency enough to absorb the shocks of traffic, or rolling stock will be pounded to pieces and the track broken down.

In the case of street railways, the concrete ballast is rigid, and the resilience must be obtained in the tie.

Dayton Mechanical Ties furnish this resiliency through a confined asphalt cushion upon which rests a white oak block. While it does not permit a perceptible up-and-down movement, this resiliency is ample to absorb all the shocks and pounding. As a result, track laid on Dayton Ties stays in perfect condition for years—with ridiculously low maintenance.

Such tracks are considerably less noisy, and repairs on rolling stock running over it are reduced to a minimum.

There is a real story for you in Dayton Mechanical Ties—*send for it today.*

***The Dayton
Mechanical Tie Co.***
DAYTON, OHIO



Time to Spare

TRAVELING by horse car was so slow that a few minutes spent in boarding or alighting did not matter one way or the other. In modern railway service, however, boarding and alighting time is an important factor in the operating schedule. Seconds saved by National Pneumatic Door and Step Equipment at each stop mount into extra car miles every day.

NATIONAL PNEUMATIC COMPANY

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CHICAGO
518 McCormick Building

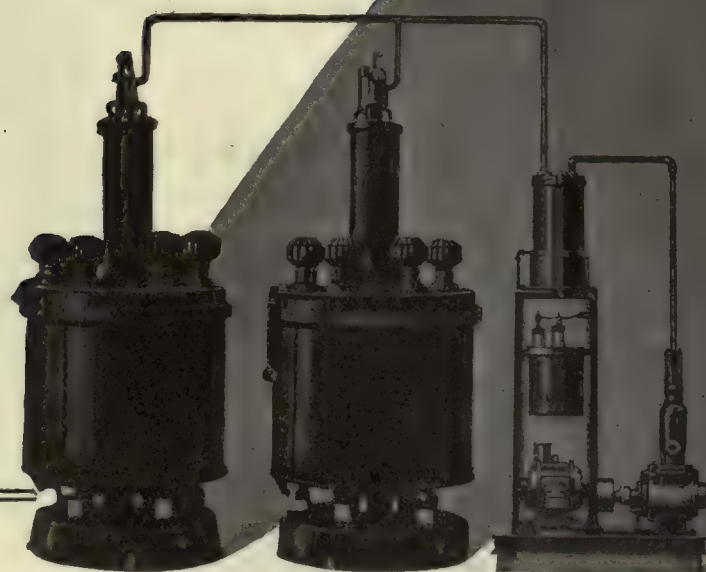
MANUFACTURED IN
TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
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American BROWN BOVERI

2. Simple operation --- and



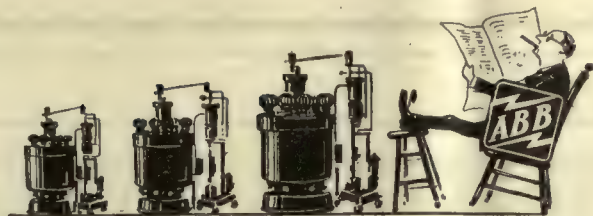
Principal Products

Mercury-Arc Power Rectifiers
(steel enclosed)
Electric Locomotives—for any
system of current, high or
low tensions
Complete equipment for rail-
way electrification

Rotary Converters
Motor Generators
Diesel-Electric Locomotives
Mining Locomotives
Switches, Controllers and all
Auxiliary Equipment
Automatic Regulators

Steam Turbo Generators for
normal or high pressures
and superheats
Oil Switches
Condensers and Auxiliaries
Relays
Turbo Compressors and Blowers

Electric Furnaces
Induction Regulators
Ships
Diesel Driven
Turbine Driven
Electrical Driven
Structural Steel Fabrication



Mercury-Arc Power Rectifiers

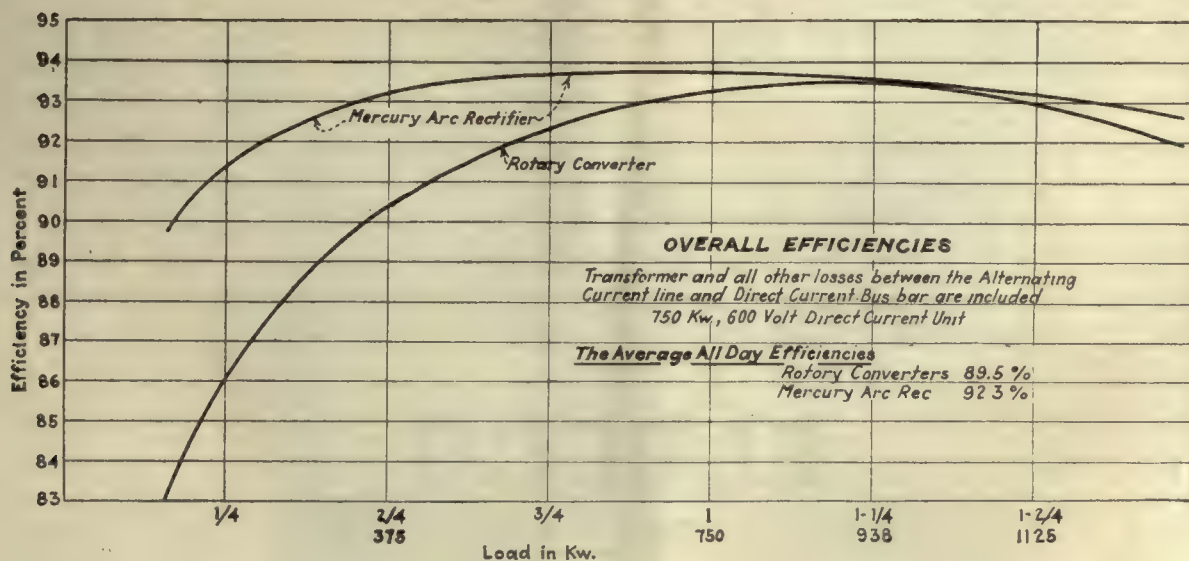
minimum attention!

Chief Advantages

1. Efficiency high over the whole working range.
2. Simple operation and minimum attention.
3. No synchronizing.
4. Very high momentary overload capacity and insensibility to short circuits.
5. Negligible maintenance.
6. Low weight. No special foundations.
7. Noiseless and vibrationless operation, consequently rectifier substations can be erected in densely populated localities.
8. New sub-stations need only be of light construction. In many cases old houses can be converted, while the plant can often be erected in places that could not be considered for rotating machinery.

Especially adapted to electric railway conditions, where automatic, laborless substations are employed as a matter of financial necessity. Mercury-arc power rectifiers can be furnished in units of any size up to 3000 kw. capacity. They have no moving parts other than small auxiliary apparatus.

American Brown Boveri Electric Corporation
165 Broadway, New York, N. Y. Camden, New Jersey
230 South Clark Street, Chicago, Illinois



AMERICAN BROWN BOVERI



Modern Equipment Necessary To Prosperity

The day is past when street railways can get by with dingy old cars, bad tracks, and feeder lines supported by unsightly poles.

Competition by other modes of travel has grown too keen. Improvement in physical property is an absolute necessity to hold public approval.

The sturdy, lasting quality of Elreco Steel Poles impresses upon the public

the worth of the line using them, and adds to public confidence. Such confidence is always reflected, both in the fare box and in the stock market.

Elreco Combination Steel Poles will carry all electric wires, as well as street lights when necessary.

Let us tell you more about Elreco Poles. Send for catalogue and specifications.

ELRECO

== POLES ==

The Electric Railway Equipment Co.

CINCINNATI, OHIO

New York Office, 30 Church St.

Memphis Street Railway

—installs New Modern Cars—
—stream line painting and plush upholstered seats



32 of these new cars just delivered
to Memphis Street Railway by the
Quality Shops



Further particulars on request

St. Louis Car Company
St. Louis, Mo.

“It absorbs vibration,



H. C. Benagh, Engineer of Maintenance of Way for the Nashville Railway & Light Co., Nashville, Tenn. Mr. Benagh has had long experience with electric railway engineering problems, and is a recognized authority in the South.

and protects the pavement"

says H. C. BENAGH

"IN the construction of a T-Rail track along a paved street—especially where the wearing surface is asphaltic—the flangeways are the weak points in the pavement." That is the view recently expressed by H. C. Benagh, Engineer of Maintenance of Way for the Nashville Railway & Light Co., Nashville, Tenn.

"The dust and dirt accumulating in these flangeways are packed and crushed downward into the wearing surface. This causes a rupture of the street paving, and rail vibration tends to make the situation worse.

"The harmful effects, we find, can be greatly minimized by installing an asphaltic rail filler along the rail. This resilient compound forms a most satisfactory flangeway. And in addition, it absorbs the shock and vibration to a large extent. Thus, in both ways, it protects the pavement contiguous to the rails."

Over 12,000 feet of Carey Elastite System of Track Insulation have been installed on the lines of the Nashville Railway & Light Co. with results that are highly satisfactory to the Company. The mastic compound of asphalt and fibre used in the Carey System comes in preformed slabs to fit any rail. Easily driven into place. And the small cost of installation is quickly regained by savings effected in maintenance. Write today for full details.



A section of the track of the Nashville Railway & Light Co., Nashville, Tenn. This track is cushioned with Carey Elastite Rail Filler.

THE PHILIP CAREY COMPANY, Lockland, Cincinnati, Ohio

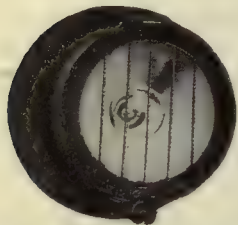
Carey Elastite
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SYSTEM OF
TRACK INSULATION



Form J34—For city service, where streets are brightly lighted, this G-E Headlight is recommended. It gives ample illumination for operation at switch-points and crossovers.



Form J59—A less powerful headlight than the J-63, designed for suburban service where a range of 400-500 feet of illumination is sufficient.



Form J63—A powerful projector for high-speed interurban lines where an intense beam is required for private right-of-way.



Come to Headlight Headquarters

Naturally, electric railways turn to General Electric for the latest and most satisfactory developments in headlights.

As specialists in illuminating problems of every kind, G-E engineers have co-operated in every step of lighting progress. G-E Headlight design has necessarily progressed with this activity.

In G-E Incandescent Headlights today you will find incorporated the fundamental principles of illuminating science, plus every modern refinement that both time and experience have brought forth.



Include headlights with the other car equipment that you specify "shall be General Electric". You thereby take advantage of General Electric's experience with problems of illuminating engineering.

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 68

New York, Saturday, August 28, 1926

Number 9

Cleveland Program

Presages Meetings of Value

EVERY railway man, no matter what his position in the industry, will find interest in the program for the Cleveland Convention of the American Electric Railway Association, published elsewhere in this issue. "Unified Transportation Service in the Public Interest," the general topic for the opening session, may well be said to characterize the entire program. It is indicative of the growing conviction that success in transportation is dependent on an honest endeavor to serve the public with the best facilities and methods that can be obtained.

It will be noted throughout the program that the movement begun last year to subordinate committee reports so as to give more time for discussion of vital topics has been extended. The reports are now being distributed to the members. They should be studied with care so that each individual interested in a particular topic will be prepared to discuss it intelligently rather than to listen to a detailed reading of the report on the convention floor. The change has already done much to increase interest in the meetings, and as it is used more its value will become even greater.

The General Manager

Threw the Switch

IT WAS a small single-track interurban property on which the general manager was in the position of a man trying to plug, with his fingers, a hundred holes in a leaking bucket. He needed money for improvements. He had severe bus and automobile competition. His track was none too good. His public was on the whole disinterested in his troubles.

But he had implicit faith in the railway. By his very enthusiasm he had raised the money for a down payment on spick and span new cars. He was determined to make his service superior to any other form of transportation in his territory. He was trying to build into his service the "pep," "snap" and "enthusiasm" that the public wanted. Since he realized that in improved service alone lay his salvation, he was intent on speeding up his cars, keeping them on time and building enthusiasm in his men.

On a particular day he was riding one of his new cars—and he rode them frequently at all hours of the day and night. The car was comfortably loaded with passengers as it approached a turnout to make a "meet." Bill, the one-man operator, slowed down preparatory to throwing the switch. He was apparently in a hurry, for the schedule was "tight." But before he could bring his car to a complete stop the general manager arose from his seat and hopped off the front end. That manager ran ahead and threw the switch before the car reached it. "Let's go, Bill," he sang out as he swung aboard again. The car picked

up speed rapidly and was soon under way to the delight of its passengers.

The incident may seem insignificant and the general manager's action unbecoming his position of responsibility. But after all the force of example is greater than any precept. Enthusiasm is communicable. In the common task of serving the passengers on that car the manager joined Bill in practicing what he preached.

Exhibit Your New Car at Cleveland

FACILITIES for the exhibit of electric railway cars during the annual convention in Cleveland are better this year than they have ever been at any former convention. Twenty-five hundred lineal feet of track space with convenient connection to steam railroads and to the surface rails of the Cleveland Railway are being provided. The exhibit committee has made a special effort to encourage and foster a showing of the progress made during the past year in improving the vehicle in which electric railway rides are sold.

This is in line with the car improvement program that is rapidly gaining momentum in the industry. Reservations for space both by manufacturers and operating companies have been made to an extent which indicates that this will be one of the most impressive car exhibits held in many years. To the car builder it offers the opportunity of capitalizing on the progress made during the year. It is unquestionably good business for every builder to be represented adequately.

But there is also a good reason for operating companies to co-operate by sending cars to Cleveland. By thus helping to make the exhibit truly representative of the best that has been done during the year, there will be an opportunity for critical comparison of designs. Every operator will benefit through the stimulus thus given to progress. Now is the time for the industry to put its best foot forward. Send one of those new cars to Cleveland!

Merchants Have a Direct Interest in Traffic Congestion Relief

ONE phase of vehicular traffic congestion is the danger to big city stores in the fact that residents of outlying districts are doing more of their shopping locally. This situation is giving much concern to merchants in metropolitan centers, where advertising of stores in some of the outlying districts occasionally amounts to one-third as much as that done in the main shopping area. In some of the largest cities, downtown merchants are endeavoring to offset this competition by establishing branch stores in sub-centers. They have been forced to realize that growing vehicular traffic has not only diverted business to other locations, but has added much to the cost of the business which they still hold. One prominent merchant has been quoted

as saying: "If merchants do not do something to relieve the present traffic situation, within fifteen years there will be no downtown shopping districts of any importance."

While merchants and bankers as well as property owners in downtown centers might well look with concern on the fast development of rival business in outlying districts, local transportation interests should also be looking ahead as to what this development means for them. Will it avoid the necessity of car rides to get people to their shopping districts? Will they walk to neighborhood stores of all kinds as they now do to local movie shows? Or, on the other hand, will the sub-center stores attract more short riders and thus prove a boon to the railway companies?

Store patronage will follow the line of least resistance. Traffic will follow that patronage. The result of decentralization, therefore, will be a shifting of the congestion problem to the various local centers to which business was transferred in the hope of finding relief. Moves of this kind probably will bring only temporary help. This prospect should bring together business interests and transportation executives in a common effort to plan a solution which will serve both to best advantage.

Public Recognition of the New Spirit of Salesmanship

ARTICLES like one on the Pittsburgh railway situation, published in the *National Municipal Review*, must eventually redound greatly to the credit of the industry. So far as electric railway men are concerned there is nothing new in the presentation, but it is ably done by the author, Charles K. Robinson, a member of the Pittsburgh Bar. He has taken old material and worked it over in an orderly and readable way that carries conviction. This in itself is art.

Mr. Robinson attributes the accomplishments at Pittsburgh to "a new spirit of management and salesmanship." Those seven words really tell the whole story. It just happens that Pittsburgh is the first of a proposed series, so that others in the railway industry who are making this phrase their watchword need not feel jealous at the selection of the Coffin winner of 1925 over them. They may be in line for treatment in the future and not know it.

The picture of the past painted by the author is not an ennobling one, but the past had to be gone over merely to point the way to the present and the future. The story of Pittsburgh is too well known to the industry to attempt to tell any part of what Mr. Robinson has said. Important as are his remarks, their significance to the industry lies in their presentation through the medium he chose rather than in their context. Particularly significant is the recognition on the part of the editor of the *Review* in his brief editorial comment to the effect that the nickel fare is little more than a memory and that to-day the important thing is adequate service at a reasonable rate. In this respect, to use his own words, the editor says that his series begins "with Pittsburgh, where better service plus a desire to please has done the trick."

It has "done the trick" there and it is doing it in many more cities. Moreover, this recognition is growing. The oftener the story is told the more frequently will citizens of other places be likely to grow introspective and to inquire to what extent they themselves may

be responsible for any difference in standard between what they enjoy and what others enjoy. When they do that, they are on a fair way to the settlement of the problem. As the *JOURNAL* for Sept. 26, 1925, said: "It is the privilege of the people to demand better and better service, and for it theirs is the obligation to pay." That means an adequate but not an onerous fare under conditions of operation in which the mutual dependence of the railway and the community is recognized. That has been the basis of Pittsburgh's progress.

Universities Can Help Promote the Science of Transportation

ADEQUATE transportation is a vital factor in the prosperity of this country and requires the services of a large number of persons, yet comparatively little attention has been given in the past to determine the best methods of training men to engage in this industry. Fortunately, under the bequest of Lord Strathcona, a pioneer railroad builder in Canada, Yale University has been placed in a position to undertake study along this line. As a preliminary the university recently authorized what is probably the most comprehensive survey of all work of this kind being done by universities, transportation agencies and others in this country. This survey has just been finished by Messrs. Topping and Dempsey, holders of Strathcona Memorial Fellowships in Yale University, and contains, in addition to the survey, recommendations of what the universities can do in the way of courses of study and research in transportation.

Those in charge of the investigation are under no uncertainty as to the need of adequate preparation on the part of those who will be called upon to conduct the transportation enterprises of the future. They also believe that in this preparation the universities can assist, just as they are now doing in other professions, such as engineering, law and medicine, and that this service need not in any way conflict with such other training conducted directly by transportation and equipment companies. Indeed, the report gives as much, if not more, consideration to the courses and research conducted by these corporations than to those at present being given in the universities and in technical and vocational schools. Electric railway transportation is considered extensively in the report, and it is satisfactory to learn that at least some electric railway companies have fully realized the necessity for conducting courses for apprentices as a logical preliminary to securing competent men for responsible positions in the organization.

Obviously, research also is a field in which the universities can be of assistance to the transportation companies. There are many questions, the survey declares, to which unbiased study by a body of scientific research workers, especially with the co-operation of the carriers, can bring most satisfactory replies.

Considerable skepticism was met among railway men during the survey, as to the ability of the universities to help much in the way of training men for transportation positions. The business is one, they said, that can be learned only on the job. The universities cannot turn out transportation specialists. The necessary knowledge can be acquired only in practical work. All this may be very true. But the same statement can be made with equal force of young men preparing for other careers.

Unquestionably, there are great opportunities in the field of local transportation where the universities can do valuable service. The transportation companies of the future will need all the assistance that they can get from men trained in economics, sociology and engineering. The Yale survey points the way in which scientific thought can help to make better transportation in the future. As courses are developed at the universities, they should receive the cordial support of electric railway companies.

For Those Who Swell and Those Who Grow

CRITICAL, indeed, of corporate statements intended for public consumption is Professor Ripley in an article "Stop, Look, Listen!" contributed by him to the *Atlantic Monthly* for September. Still the dissertation is shot through with strains of praise, and the utilities come in for much of this as well as some of the sarcasm. It is the Ripley of old that is functioning, the Ripley whose works on the railroads are classics, the Ripley who ponders well what he writes before he essays the task. But that is not the point. It is in the substance of his remarks rather than in the vehicle that the *ELECTRIC RAILWAY JOURNAL* is concerned.

It would be impossible even in a cursory way to consider here all he says. Much less would it be possible to pass upon the applicability of some of the remedies he suggests with respect to extension of the jurisdiction of the federal trade commission in the domain of the so-called industrials. He is on safe ground when he criticises the annual report that is ornamental rather than orderly. Of course, reports of the utilities are all on file with their state commissions in detail and in standard form, but that is no excuse for the inadequate annual statements rendered by many of these companies. As recently as the issue of May 8, *ELECTRIC RAILWAY JOURNAL* in a somewhat liberal characterization said that after all an annual report, just like a person, should not be ornate at the possible sacrifice of substance. Certainly the lack of uniformity in utility reports as rendered to the public greatly reduces their value for purposes of comparison. This is quickly borne in upon anybody who has attempted any statistical studies with the printed report as the only source of his material. It is difficult to be specific in comment of this kind, keep within bounds, and stimulate or even sustain the reader. This Professor Ripley does. His strictures are for the most part well deserved, and every financial editor whose duty it is to digest company statements will undoubtedly be inclined to agree not, perhaps, with all his suggested remedies but with his ideas with respect to what is essential in financial statements.

The needs which the Professor emphasizes are growing and the forms of reports which he commends, such as the excellent one of the Philadelphia Company, to mention just one, certainly are a most valuable publicity medium entirely aside from their practical value. "Stop, Look, Listen!" certainly is a provocative article. This is not the first time that Wall Street and the country at large have heeded Professor Ripley. His comments certainly will appeal to "the men who grow," and if they will condescend to stick with them to the finish, his remarks should prove helpful to "those who merely swell with the advance of the years."

A Major Process Often Has Valuable By-Products

SALESMANSHIP of transportation as developed on many modernized properties often has valuable by-products that cannot readily be calculated in advance. If the process of training car operators as salesmen is successful in its direct accomplishments, it is well enough worth the time and effort of property managers. But when applied to accomplish special results it adds a crowning touch to such efforts.

About 30 men of the transportation department of the Pennsylvania-Ohio lines organized and made a mass attack on property owners and in two days secured practically all the necessary easements for the steel towers of a new 40-mile transmission line. Prolonged and expensive delays to a necessary extension of facilities were thus obviated.

Enough that these men are better salesmen of securities. But here is tangible evidence of the additional advantages of salesmanship teachings. What man will not attack his daily job with greater spirit when he feels the essentiality of his being a part of such an organization?

Charging Depreciation on Undervalued Properties

OF SERIOUS import is the problem raised in the determination of depreciation charges for railways that have been transferred to new owners at prices below their intrinsic value. The basis on which the depreciation shall be calculated, and the rate which may be charged, may determine the success or failure of the enterprise if the new owners desire to give a continuing service. Such a situation has arisen in the case of the Jamaica Central Railways, Inc., of Queens Borough, New York City, the details of which are given in an article in this issue.

This railway was sold by the receiver at a price of about one-fourth its appraised value on a depreciated basis. For a time service was suspended. After a while the new owners decided to rehabilitate the system and resume operation. In setting up the accounts it was found that the rulings of the utility commission required charging off depreciation on a basis of nothing greater than the purchase price. This, of course, precluded the accumulation of a sufficient reserve to cover the continual reduction in real value of the road and its equipment due to depreciation.

The engineers who investigated the situation found that the average life of the elements of the property is only about six years. On the basis of the highest charges which can be set up, the property would have to last an average of about sixteen years before even its present-day depreciated value can be accumulated. When the cars and track are worn out a few years hence, heavy financing will be needed. Meanwhile, provided the fares are adequate to cover the costs of service on the basis prescribed, the car riders will be paying less than the true cost of the service.

Unless owners are allowed to set up enough reserve for depreciation in such cases as this, it is difficult to see how service can be continued in many communities where properties have been transferred for less than their worth. The industry and the regulatory bodies can well afford to give the problem the most serious consideration.

Medical Survey in Fort Worth Has Raised Health Standard of Employees

Northern Texas Traction Company, Employing 610 Men Exclusive of Temporary Workers, Follows Closely the Health of Employees—461 Men Re-examined in 1925 and 360 During the Preceding Year

HEALTH and the pursuit of happiness have been fostered in Fort Worth by the Northern Texas Traction Company for many years. The physical condition of employees is under surveillance from the time of the rigid examination upon application for a position with the company until a separation occurs. The re-examination offered these men and urged upon them is perhaps one of the most important humanitarian accomplishments that industry can offer. Maladies in their initial stages are thus discovered and corrected whenever possible, thus extending the years of useful life and often avoiding the misery of a sickly old age.

Following the re-examination of employees, corrective measures are recommended that have aided materially in raising the classification, even though because of the low yearly turnover the average age of employees has increased from 35 years to 39 years in a period of about four years. Over 90 per cent of all employees have been with the company five years or more, and 11 per cent have been in service twenty years or more.

Before the group reinsurance in outside companies was discontinued the work of the medical staff was so successful that a total reduction of 30 per cent in the reinsurance premiums was obtained because of the high health record on the property. The discontinuance of group reinsurance is only experimental and the company is not committed to continue this policy.

All employees, except colored and temporary men, are required to belong to the Mutual Aid Society, for which \$1 per month dues are collected, the company contributing a like amount. Returns to the employees are in the form of sick benefits amounting to \$2 per day for a total of 120 days, and \$1 per day for 60 additional days, making a total of \$300 possible benefits for any one sickness or accident. No benefits are paid for less than seven days. Illness and accident payments begin after the seventh day, although payments up to the first day of illness are retroactive. In addition, employees are allowed \$15 a week hospital benefits in case hospital service is necessary.

Free medical attention is furnished to all employees without additional charge, and this attention includes all illness or accidents as well as major operations. Any prescription for drugs which the employee requires is also filled without additional cost to him. A death benefit of \$500 is allowed to any employee of less than six months seniority, and after six months this becomes \$1,000.

The primary value in the light of real accomplishment arises from the periodical examination of employees that is urged upon all men and women in the

PHYSICAL EXAMINATION			
Working Diagnosis		GYN/OB	
General Condition		Parasites	
Temperature	Height	Vagina	
Pulse Rate	BP S	Uterus	
Respiration	Reflexes	Tubes	
PHYSICAL FINDINGS		Ovaries	
HEAD AND NECK		Menses	
Eyes		Bleeding in Menstruation	
Teeth		BUTYLM	
Cerv. glands		Prostate	
Thyroid		Benign	
Saliv		Parathyroid	
Color		Furcula	
CHEST		GLANDULAR	
Inspection		Cervical	
Dullness		Inguinal	
Brachycephaly		Axillary	
Bulge		Endothoracic	
Spines		BRAIN	
CARDIO VASCULAR		Color	
Cardiac Enlargement		Respiration	
Sound at apex		Ventricular Beat	
Pulse		BONES AND JOINTS	
Character			
Regular			
Irregular			
ABDOMEN			
Inspection			
Liver			
Spleen			
Kidney Bl			
Tenderness			
Reflexes			
Muscles			
BLOOD		SPUTUM	
DIFFERENTIAL		Quantity	
Address		Character	
Quantity		Consistency	
Color		Other	
Bacteria, etc.		T. S.	
URINE		FECES	
Character		Color	
Other		Consistency	
Reaction		Parasites	
Micro-organisms		Origin	
STOMACH		CULTURE	
Inspection		Character	
Other		Glands	
Reaction		Cultured	
Micro-organisms		Worms	
GASTRIC CONTENTS		SPINAL FLUID	
Flow, BC		Character	
Consistency, BC		Glands	
Tend, BC		Cultured	
Blood		Worms	
Lactic Acid			
Hemorrhage			
X-RAY REQUISITION			
Name		Age	
Radiographic		Date	
Fluoroscopic			
Examination of			
Clinical Diagnosis			
Remarks			
X-Ray Treatment For			
Factors of Di			
BIOTHEOLOGICAL AND FLUOROSCOPIC FINDINGS			
Diagnosis			

**Sample Blanks Used in the Examination of Northern Texas Trac-
tion Employees at the Coffey Clinic, Fort Worth, Tex.**

A thorough initial examination of all prospective employees is required. These records shown above and on page 335 are kept in folders. Re-examination is urged on all employees and these further records with a notation of all incidental calls are recorded in the proper places on the permanent records of each man or woman employee.

EAR, NOSE AND THROAT RECORD
THE COFFEY CLINIC

NAME _____ SEX _____ RACE _____ ADDRESS _____ OCCUPATION _____

AGE _____ DIAGNOSIS _____ COMPLAINT _____

EAR FUNCTIONAL TESTS: RT. EAR _____ L. EAR _____ WATCH _____ RINGE _____ SCHWABACH _____ WEBER _____ LOWTONE _____ C-4 _____ GALTON WHISTLE _____

TRANSILLUMINATION: MAXILLARY SINUSES: RT. _____ L. _____ NORMAL _____ CLOUDY _____ FRONTAL SINUSES: RT. _____ L. _____ NORMAL _____ CLOUDY _____

NOSE: EXTERNAL: SEPTUM _____ STRAIGHT-DEVIATED _____ RT. LEFT PERFORATION _____ TURBINATES _____ GROWTHS _____

THROAT: TONSILS: RT. _____ L. _____ PHARYNX _____ LARYNX _____

DATE _____ REMARKS _____ TREATMENT _____

THE COFFEY CLINIC
306 WEST BROADWAY FORT WORTH TEXAS
PATHOLOGICAL LABORATORY RECORD

NAME _____ ADDRESS _____

URINE		URINE	
Date	Acetone	Date	Acetone
Quantity	Diabetic	Quantity	Diabetic
Character	Indican	Character	Indican
Reaction	Bile	Reaction	Bile
Sp. Gr.	R. B. C.	Sp. Gr.	R. B. C.
Albumin	Pus	Albumin	Pus
Sugar		Sugar	
Casts		Casts	
Crystals		Crystals	

PERSONAL HISTORY

Name _____ Case No. _____

Age _____ Sex _____ Race _____ H. W. Yrs. _____

FAMILY HISTORY

Father _____ Age _____ Health—If dead, cause _____

Mother _____

Brothers _____

Sisters _____

Wife or Children _____

Tuberculosis or Cancer history _____

CHILDHOOD DISEASES

Measles _____ Diphtheria _____

Scarlet Fever _____ Whooping Cough _____

Chicken Pox _____ Mumps _____

Polio _____

ADULT DISEASES

Smallpox _____ Fractures _____

Malaria _____ Dislocations _____

Pneumonia _____ Operations _____

Pleurisy _____

Rheumatism _____ Lungs _____

Influenza _____ Heart _____

Typhoid Fever _____ Stomach _____

Dysentery _____ Bowels _____

Infection _____ Kidney _____

Vaccination _____ Skin _____

HABITS

Smoker _____ Drugs _____

Chew _____ Sleeping _____

Coffee _____ Eating _____

Liquor _____ Venereal _____

PRESSENT ILLNESS

Chief Complaint _____

Date of Onset _____

Mode of Onset _____

Cause _____

Headache _____ Location _____

Pain _____ Location _____

Insomnia _____ Type _____

Referred _____ Refers to _____

Refers to _____

Names _____

Vomiting _____ Character _____

Temperature _____

Diarrhea _____ Stool _____

Constipation _____

Edema _____

Shortness of Breath _____

Nervous _____

Treatment, if any? _____

REMARKS:

MEDICAL RECORD

Name _____

Address _____

Entered Service _____ Left Service _____

BENEFITS PAID

DATE	CAUSE	DISABLED	RECOVERED	AMOUNT

SUBSEQUENT ILLNESS

Name _____ Date _____

Diagnosis _____

PRESENT COMPLAINT

PROGRESS RECORD

PHYSICAL FINDINGS

The Forms Used to Record Medical Examinations by the Northern Texas Traction Company Give a Complete Record of the Physical Progress of the Employee. From This Record Corrective Treatment Is Prescribed and Incipient Chronic Illnesses Prevented

service of the company as a part of the free service of the Mutual Aid Society. In this way corrective treatment is applied to incipient diseases before they become chronic. The result is that of 271 men who were examined both in 1924 and 1925, 150 men remained in the same health classification for the second year, 76 raised their grade and 45 dropped into a lower classification. While re-examination is not compulsory, the results have been so gratifying that more men are be-

ginning to see the advantage of discovering incipient illness and correcting such troubles before they develop into a more serious condition.

Advantages to the Mutual Aid Society and the company are likewise obvious. A thorough examination before employment is required and this alone eliminates many undesirable prospects. This examination includes a thorough physical examination, special examination of eye, ear, nose and throat and laboratory tests of the

blood and urine. This is the same routine which is followed up in the annual medical survey. If these general tests indicate possible complications the prospective trouble is further investigated to the end that definite corrective measures can be applied.

Five classifications, from A to E, inclusive, are used. To be in class A requires practically perfect physical condition. Even filled teeth or slight troubles with the eyes, skin or throat will prevent an A classification. Of the eight men in this grade in 1924, only four could remain in 1925, because of a more severe standard required for this classification.

The complete classification of men examined in the years 1924 and 1925 are shown as follows:

Class	1924		1925	
	Men	Per Cent	Men	Per Cent
A	8	2.2	4	0.9
B	164	45.5	248	53.8
C	156	43.3	185	40.1
D	30	8.5	24	5.2
E	2	0.5	None	....
Totals	360	100.0	461	100.0

Of the 461 men examined in 1925, 271 had been previously examined in 1924 and the two years cover nearly all of the employees. It is seen that considering the group as a whole the number of employees in the higher classifications has been raised. The decrease in grade A is of little consequence. The increase of grade B and the decrease of C and D is of greatest importance in showing the increased average health conditions.

Further analysis of the physical condition of the male employees of the Northern Texas Traction Company shows the following defects observed in the re-examinations. These defects are divided into twelve classifications, as shown in the table in the next column.

This association of employees has full appreciation of the value of preventative medicine as taught them by Dr. Alden Coffey, who has been employed by it for the past eighteen years. The medical studies conducted through the co-operation of the Northern Texas Traction Company's employees and the enlargement of his

	Per Cent	
	1924	1925
1. Eyes.....	13.6	8.7
2. Ears.....	11.7	9.9
3. Mouth.....	9.3	12.3
4. Nose and throat.....	21.3	12.2
5. Respiratory.....	0.8	0.1
6. Genito-urinary.....	7.0	12.0
7. Cardio-vascular.....	7.3	9.6
8. Digestive system.....	14.9	14.4
9. Nervous system.....	0.1	0.6
10. Skin.....	3.0	7.6
11. Mutilation and deformities.....	0.7	.8
12. Miscellaneous, hernia, etc.....	10.3	10.9
Total.....	100.0	100.0
Total men examined.....	360	461
Total defects.....	1,092	1,449
Defects per man.....	3.03	3.1

private practice has resulted in the equipment of a modern clinic and enlargement of the medical staff, which at this time includes five doctors, all specialists in various lines, with six additional men and women trained in laboratory and general clinic work.

This clinic is equipped to perform a general medical and hospital service except major operations, the surgical work being carried on at one of the local hospitals. It is planned to establish a dental clinic in the near future, but at the present time only dental examination is performed, including X-ray of teeth as well as of the body.

Traffic Lines Easily Marked in Youngstown

CLEARANCE lines on the streets of Youngstown denoting the swing of cars rounding the curves are quickly applied by the use of the machine illustrated. This road marker is manufactured by the Continental Products Company, Euclid, Ohio. The proposed line to be marked on the pavement is fully sketched out and the machine pulled along over this, automatically leaving a clean, white band in its wake.

The cost of the machine was divided between the city and the Youngstown Municipal Railway. The work of marking the bands on the streets is done by city forces aided by an inspector of the railway. The words "car swing" are stenciled on the pavement to warn motorists against getting too close.



Clearance Lines at Car Curves and Stenciled Signs on Pavement Warn Motorists in Youngstown, Ohio

At left is shown the device for marking swing lines used in Youngstown. This is a labor saver and produces a clean white band. At the right, traffic line marker at work showing the swing

line and the safety margin used in Youngstown, Ohio, by the Youngstown Municipal Railway. "Car swing" signs are painted by use of stencils.



At the Intersection of Washington and Market Streets, Newark, N. J. Buildings on the Southeast and Northwest Corners Were Demolished in Order to Eliminate a Bad Jog, Thereby Making Possible the Installation of a Diagonal Crossing and Permitting Through Railway Operation on Washington Street

Track Extensions Improve Transportation Facilities in Newark

Public Service Railway Has Spent More than \$300,000 to Develop a Second North and South Route Through Downtown Section, and Thereby Relieve Congestion on Broad Street — 1½ Miles of New Track Built

WITH the completion of the track construction work now in progress on Washington Street, Newark, N. J., the Public Service Railway will have a second double-track route passing north and south through the central business district of the city. To accomplish this, the company has spent considerably more than \$300,000 in reconstructing the existing tracks on this street, and extending them to connect at the two ends with important routes leading to outlying sections. Approximately 1½ miles of new track have been built. In addition to this, the city government has spent a large sum to eliminate a troublesome jog at the intersection of Washington and Market Streets. It is planned to divert to this new route part of the railway service now operated on Broad Street, two blocks away, where congestion has become a source of delay to all track movements.

More than ten years ago, when plans were being made for the building of the Public Service Terminal in the heart of Newark, this improvement to Washington Street was included in the project. The primary purpose of building the Terminal Building was to reduce the number of cars crossing the busy intersection of Broad and Market Streets. Access to the terminal was arranged by subway from Washington Street on the

west and by elevated structure from Mulberry Street on the east. The city agreed to undertake the improvement of both of these streets as its share of the plan to improve transportation facilities. An act was passed at that time by the State Legislature giving electric railways the right to construct connections between existing lines not more than half a mile apart. Connection of tracks on Washington Street with those on Broad Street and Clinton Avenue, came within this category.

Due to the war this comprehensive plan was only partly carried out. The terminal was built with its connections to Washington and Mulberry Streets, and certain improvements were made to the latter thoroughfare. The project of eliminating the jog in Washington Street, however, was delayed and consequently no effort was made by the railway to construct connections at the ends of this street.

Although the terminal project was not carried out entirely as planned, considerable relief was afforded to the Broad and Market Street intersection. As time went on, however, congestion again occurred. This was due in part to the development of extensive bus service and in part to the growing use of the private automobile. A recent traffic count showed more than

**Track-Laying and Paving Methods Used in the Washington Street Extension
of the Public Service Railway, Newark, N. J.**



Track Structure Consists of 7-In. 101-Lb. Tram Rail on Wood Ties with Stone Ballast. This Is the Present Standard Type of Construction of the Railway for Use in Paved Streets



A Curb Separates Railway Area that is Paved with Granite Block from the Rest of the Street Paved with Asphalt. This Shows the New Track on South Washington Street



Tamping Ballast Under the Ties of the New Track on North Washington Street



Concrete Was Poured on the Ballast Even with the Tops of the Ties



Pouring Hot Mastic Filler between the Granite Paving Block

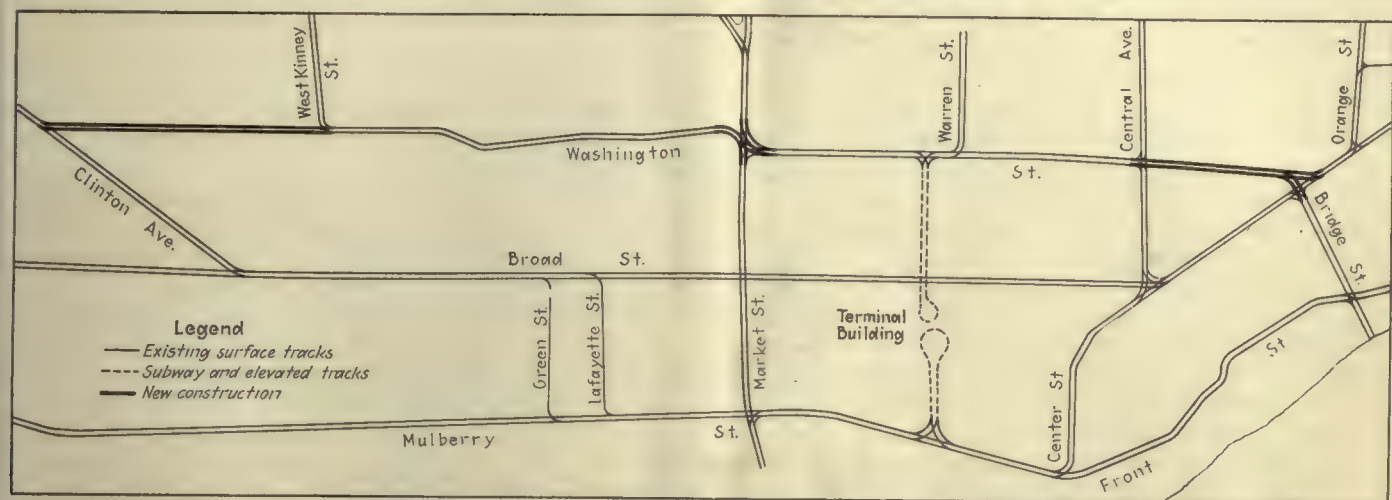
2,700 vehicles crossing this intersection during the maximum hour. Of this number about two-thirds were on Broad Street as shown in the following table:

TRAFFIC COUNT AT BROAD AND MARKET STREETS				
Broad Street				
	North Bound	South Bound	Both	Directions
Cars.....	101	75	176	
Buses.....	244	148	392	
Vehicles.....	625	663	1,288	
Total.....				1,856
Market Street				
	East Bound	West Bound	Both	Directions
Cars.....	87	94	181	
Buses.....	18	21	39	
Vehicles.....	216	416	632	
Total.....				852
Grand total.....				2,708

While the street cars are not a primary cause of the existing congestion as shown by these figures, their movement is seriously hampered under present condi-

Granite block paving is used in the railway area, although the rest of the street is paved with asphalt. A granite curb was installed by the city about 18 in. from each of the outer rails to separate the two pavements. Re-cut blocks were used on a sand cushion. Between the rails the blocks are laid cross-wise while outside the rails they are laid longitudinally parallel to the granite curb. Mastic filler is used between the blocks with a top dressing of sand.

In accordance with the usual practice of the company, this construction work has been done by an outside contractor. The railway has found it difficult to secure sufficient labor for large track construction jobs on account of the seasonal nature of such work. General contractors on the other hand having work for their men throughout the year do not experience this difficulty. Installation of special track work at the intersection of Market and Washington Streets, and



Track Layout in the Central Business District of Newark, Showing New Track Construction That Will Give Public Service Railway Another Through North and South Route

tions. The narrowness of Mulberry Street and its remoteness from the shopping district prevented its use as a relief artery. Creation of a through north and south route on Washington Street parallel to Broad Street, two blocks away, will make it possible to reroute a number of car lines to avoid congestion.

A little more than a year ago the city definitely undertook the straightening of Washington Street at Market, and the railway, as the first step of its program, undertook the reconstruction of existing tracks on that street. This involved the installation of complicated special trackwork at the above mentioned intersection. In June of the present year, the railway received authority to make the extensions at the two ends, totalling approximately 7,000 ft. of single track. Relationship between these extensions and the existing trackage is shown on an accompanying map.

On this job, the standard track construction adopted by Public Service Railway for paved streets was used. A 6-in. layer of stone ballast was laid on a dirt foundation compacted by a steam roller. Under special work this ballast was pneumatically tamped. Elsewhere it was hand tamped. Wood ties were placed on the ballast and concrete poured, leveled with the tie tops. The rail used was 7-in. 101-lb. tram. Lincoln welded joints were used, the plates being seam-welded and the bolts spot-welded. Less tendency for dirt to collect in the groove, and lighter weight are advantages of tram rail over grooved girder rail in the opinion of the management.

at the ends of the new connections has been done by the maintenance of way forces of the railway as it is thought that outside labor is not sufficiently skilled for this difficult work.

Pennsylvania-Ohio Employees Get Easements on New Right-of-Way

EASEMENTS for the steel towers of the new 40-mile transmission line between Youngstown and Toronto, Ohio, were recently obtained by trainmen and supervisors who were found proficient in the selling of the company's securities. Several campaigns of stock selling, accompanied by the salesmanship training that employees have received, have made possible the accomplishment of this unique stunt.

First an airplane survey was made over the proposed route of the 132,000-volt transmission line connecting the company's new power station on the Ohio River with the distribution substation just south of Youngstown. Since this route was largely through developed farm lands, it was decided to make a mass attack on the owners of this property so that easements could be obtained without giving the opportunity to work up opposition that often proves fruitful of delay and excessive costs.

Several teams were made up from men who had made the best records in the selling of securities. These men included the manager of railways, three superintendents, the machine shop foreman and almost twenty

inspectors and trainmen. Suitable captains were selected and the territory was divided and assigned to each team. Explicit instructions were given and the necessary papers were prepared and distributed. When the zero hour arrived, the teams were all in readiness and in two days 93 per cent of the easements were obtained.

One man on one of the teams did not show up for three or four days but on his return his explanation was quite plausible. It happened that his man was then visiting in West Virginia, so he hopped in his automobile, drove down and came back with the easement papers in his pocket. Nothing remained but for the treasurer to pay the actual money agreed upon.

Traction Bridge Used by Highway Traffic

BY D. H. WALKER

Assistant Engineer T. H., I. & E. Traction Company

WHERE the tracks of the Terre Haute, Indianapolis & Eastern Traction Company are parallel to the National Old Trails Highway, at a point a few miles west of Richmond, Ind., it was necessary that the Indiana State Highway Commission replace an old wooden bridge. A detour by road would have been long and over roads comparatively narrow for the heavy traffic on this highway. At some other bridges replaced at the same time in the immediate vicinity the Highway Bridge Department constructed a temporary detour and wooden trestle crossing the stream a few feet distant from the wrecked structure. Such a procedure would have been rather costly in this case owing to the nature of the stream bed and rather dense timber growth in the bottoms. The commission then obtained permission from the management of the traction company to divert highway traffic over the interurban bridge under certain conditions.

Accordingly the floor of the electric road bridge was covered with 3-in. planking spiked to the bridge ties. Guard rails were removed in order to provide a smooth surface. A guard fence, painted white, was erected on both sides for the length of highway travel on the interurban right-of-way. The turnoffs from the highway were made about 150 ft. distant from the bridge at each end in order to give the contractor room for tools and equipment while constructing the new bridge. As the rails were only a few inches above the pavement and no ditch existed between the track and highway it was easy and inexpensive to make a smooth passage-way from the highway to our bridge.



Railway and Highway Signals Interlocked Near Richmond, Ind., While Vehicular Traffic Temporarily Used the Bridge of the T. H., I. & E. Lines

As this highway carries a heavy and constant stream of traffic it was necessary to prevent any vehicle from driving on the bridge when cars were approaching. It was also desired to slow up the interurban cars as little as possible. Naturally only one-way vehicular traffic could be accommodated, and means were thus necessary for stopping traffic after an interval in any one direction and then reversing the direction of the traffic.

Our electrical department worked out an interlocking control for block signals to handle the traffic. As can be seen in the accompanying illustrations each direction of highway traffic was faced by a control block showing "Stop" or "Go." These signals were of the type used for traffic control in the city streets. Our cars were controlled by blocks with standard red and green signal projectors, one being placed about 200 ft. ahead of the bridge at each end. The interlocking of signals provided three combinations. When the track blocks were green both directions of highway traffic were red. When eastbound highway showed green, "Go," blocks were red for westbound highway and in both directions on the track. Likewise, when westbound highway traffic was moving there were red blocks for east-bound highway and in both track directions.

A watchman's shanty was built at one end of the bridge and the control block for the signal placed there. From this shed he could see cars approaching from both directions and could likewise see the highway each way. The watchman was maintained 24 hours a day. The cars approached the bridge under full control and watchman stopped highway traffic before their arrival.



Railway and Old Highway Bridges as They Appeared Before Work Began



Watchman's Shanty with Long View in Both Directions, from Which Signals Were Controlled

Depreciating a Property Sold Below Cost

Replacement of Elements When Worn Out Is an Important Consideration in the Charges to Depreciation Where Capital Invested Is Less Than the Physical Value—Rate Should Make Possible Continued Operation Over a Period of Years

NCESSITY for an adequate depreciation reserve has raised an interesting question in the case of the Jamaica Central Railways, Inc., Jamaica, N. Y. This property was recently reorganized from the defunct Long Island Electric Railway. It was purchased at a price far below the intrinsic value of the road. In connection with the operating accounts it was necessary to establish a rate for depreciation which would permit continued operation of the property over a period of years.

To this end a study was made for the road by Fisk & Roberts, consulting engineers of New York. This study included an analysis of the various elements owned by the company and subject to depreciation, the rules now in use by transit companies in New York City, and a forecast of the company's investment, which can be expected virtually to disappear within the next three years.

As a result of the study, it was recommended that an amount equivalent to 2.62 cents per car-mile be set aside as a depreciation reserve. The principal points raised are discussed in the following abstract:

DEPRECIATION RESERVE NECESSARY

The necessity of a depreciation reserve for street railways is recognized in the prescribed uniform system of accounts of the Transit Commission of New York, which provides that some definite rule shall be adopted by each company by which the total maintenance, including capital consumed in operation, accruing in a given year shall be charged during that year to operating expenses. However, the basis of the depreciation charge and the method of accumulating the fund are not specified by the Transit Commission, and within certain limits are optional with each company.

The uniform system of accounts as prescribed by the New York Transit Commission, which has jurisdiction over that part of the road in New York City, states, regarding road and equipment and other capital purchased, that when any road or other fixed capital in the form of a going or completed plant is purchased, an appraisal of such capital so acquired shall be made. The different constituent elements of the road (and equipment, if any) or other capital acquired shall be appraised at their structural values; i.e., at the estimated cost of replacement or reproduction less deterioration to the existing condition through wear and tear, obsolescence, and inadequacy. If the actual money value of the consideration given was at the time of the acquisition in excess of the appraised value, the excess shall be charged to the account. Other intangible street railway capital, and the appraised values of the constituent elements shall be charged to the appropriate accounts as designated in the following definitions of accounts for expenditures for road and equipment and other fixed capital. If the actual money value of the consideration given was not in excess of such appraised value, the actual money value shall be distributed

through the accounts in proportion to the appraised value of the constituent elements.

Inasmuch as part of the property of the railway is outside New York City it falls within the jurisdiction of the Public Service Commission. Hence consideration had to be given to that commission's uniform system of accounts, which states in part:

Depreciation accounts are provided in order that carriers may, through the creation of adequate reserves, equalize from year to year, as nearly as is practicable, the losses incident to important retirements of buildings, bridges, trestles, etc., or of large sections of continuous structures like track or electric line, or of definite units of equipment. "Losses" as used above means in each case the difference between the original cost to the accounting corporation of the property retired and its salvage value at the time of its retirement.

The cost of replacing minor parts, which is not recorded by any entries in the road and equipment accounts, and which is commonly called the cost of "repairs" or "maintenance" as distinguished from the cost of "replacements" of large units, need not be provided for through depreciation charges. The amounts charged to depreciation accounts should be upon a basis determined to be equitable according to the carrier's experience and best sources of information and should in all cases be sufficient to provide during a period of years a reserve against which can be written off all losses sustained upon the retirement of property either when its natural life has expired or when it has become obsolete or otherwise inadequate for efficient service.

While each corporation may determine for itself the amount to be reserved annually for depreciation as herein defined, the commission will necessarily, in deciding rate and other cases, have to pass upon the adequacy or inadequacy of such charges. As an indication of its policy in this respect, therefore, the suggestion is made, based upon the commission's experience in the regulation of electric railway utilities, that a depreciation charge amounting to not less than 2 per cent or more than 5 per cent per annum on the average total cost of all ways and structures or to not less than 2 per cent or more than 10 per cent per annum on the average total cost of all equipment, will, under normal operating conditions, be generally less open to question than rates which fall above or below these limits. It is also suggested that depreciation rates should preferably be stated in terms of a percentage of the cost of depreciable property, because it is believed that form of statement is, on the whole, the clearest and simplest way of expressing the normal depreciation charge and furnishes the readiest basis for comparison between companies. It is not necessary, however, that separate reserves shall be set up for each unit of depreciable property, nor even for each class of property, but it is the intention that a general depreciation reserve shall be maintained, adequate at all times to cover the losses which are realized when large units of equipment or important sections of continuous structures are retired from service as a result of wear and tear, obsolescence, or inadequacy.

VALUE OF THE PROPERTY

The investment of the present owners of the Jamaica Central Railways, Inc., in property subject to depreciation consists of the sum paid for the property, which was offered at public auction by the referee in the Long Island Electric Railway receivership, less that portion of the amount which represents non-depreciable real estate, and in addition all subsequent capital expenditures.

In determining the value of the various items making up the property purchased at the foreclosure sale, the instructions from the system of uniform accounts of the New York Transit Commission were followed, particularly that portion which says that if the actual money consideration given was not in excess of the appraised value, it should be distributed in proportion to the said appraised value of the constituent elements.

At the foreclosure sale of the former Long Island Electric Railway the successful bid made on behalf of the present owners was \$115,000, which was much less than any appraised value of the property. The estimated reproduction cost, less depreciation, as of the date of the foreclosure sale was \$447,425. Of this

of this station would not exceed three years, and should be depreciated at the rate of 30 per cent.

Of the rolling stock 25 passenger cars were appraised at \$75,000, and written off to \$19,100 to correspond with the purchase price of \$115,000. With a life determined by the engineers at approximately five years, they were depreciated at 20 per cent.

The eleven other cars purchased are mainly service equipment. While in worse condition than the passenger cars, they are used less, and were also depreciated at 20 per cent.

MATERIALS AND SUPPLIES

Materials and supplies taken over by the company at the referee's sale were appraised at \$4,679. Adjusting this account in proportion to the purchase price they are valued at \$1,200. As a result of the normal obsolescence and loss incident to handling such supplies, it was estimated that the account should be depreciated at 5 per cent per annum.

The buildings consist of a substation, carhouse, shop and passenger terminal. These buildings were appraised by the company's experts at \$65,000, and, adjusted in accordance with the commission's rule, will be capitalized at \$16,730. They are useful only for railway purposes, and it has been estimated that they have a future life of not more than ten years. Upon this basis the annual depreciation charge covering the buildings amounts to 10 per cent.

DEPRECIATION OF AFTER ACQUIRED PROPERTY

Six open cars purchased by the company since taking over the property were appraised at \$12,000. The purchase price plus expenditures made in rehabilitation amounts to \$8,463.24. Since the commission has suggested that all open car operation must be abandoned within the next two years, these cars have been depreciated at the rate of 50 per cent.

Ten Birney cars purchased have been appraised at their actual cost of \$39,500. Since these cars were recently overhauled and repainted, they were depreciated at a rate of 15 per cent.

Spare motors were purchased in the amount of \$1,000. Since they will meet with rather severe operating conditions, this equipment was depreciated at the rate of 20 per cent. The shop machinery taken over amounted to practically nothing, but subsequent to the sale the company has acquired new and second-hand machinery in the amount of \$709. This equipment was depreciated at the rate of 15 per cent. Additional materials and supplies purchased amounting to \$5,174.22, were depreciated to cover losses incident to handling and breakage amounting to 5 per cent. Office furniture and fixtures in the amount of \$2,004 were estimated to depreciate at the rate of 10 per cent.

In acquiring the original property taken over the company incurred charges to capital account amounting to \$20,000 to cover financing, legal and other organization expense prior to the acquisition of the property. This capital charge should be amortized over a period of not more than ten years, rather than be carried indefinitely as a capital expenditure.

DEPRECIATION CHARGES SUMMARIZED

Tables II and III show the prorated cost of the original property purchased from the referee and the actual cost of all property acquired subsequently. Opposite each item is the estimated amount which should

TABLE I.—APPRAISED AND ADJUSTED VALUES, PROPERTY PURCHASED BY JAMAICA CENTRAL RAILWAYS

Account	Present Values	Costs Adjusted to Purchase Price
Way and structures.....	\$199,509	\$51,400
Substation equipment.....	10,937	2,820
Second Avenue cars.....	75,000	19,100
All other cars.....	7,300	1,880
Material and supplies.....	4,679	1,200
Buildings.....	65,000	16,730
Grounds.....	85,000	21,870
Total.....	\$447,425	\$115,000

amount \$362,425 represented depreciable property used and useful for railway purposes.

Following the rule laid down by the commission, the distribution of the purchase price among these various accounts was determined. The corresponding figures, along with the appraised values, are given in Table I.

Various expenditures for capital account have been made since the foreclosure sale. These were found to total \$79,531. Thus the cost of property purchased at the foreclosure sale and the after acquired property total \$194,536. This does not represent the appraised value of the property owned by the railway, which, with the after acquired property included at actual cost would be \$526,956.

The rule as laid down by the commission was followed and depreciation charges were based on the cost to acquire the property, rather than its appraised value.

ESTIMATED ANNUAL DEPRECIATION

The amount of money which should be set aside annually to cover the depreciation of the company's property acquired at the referee's sale necessarily was based on three factors as follows:

The appraised present value of the property acquired at the referee's sale, fixed at \$447,425 less \$85,000 to cover land and grounds on which there is or should be no depreciation.

The adjusted values of the various items acquired at the referee's sale to correspond with the total purchase price of \$115,000.

The addition of the various items of property purchased subsequent to the referee's sale.

DEPRECIATION RATES

After an examination of the property making up the way and structures account, it was estimated that the average remaining life of all property making up this account is $3\frac{1}{2}$ years, and after allowing for possible salvage value the annual rate was fixed at 25 per cent.

The substation equipment is old, obsolete and badly worn. Its replacement is under consideration at the present time. It was estimated that the maximum life

be set aside annually to provide an adequate depreciation reserve. The total of all property acquired on the basis of this actual cost is \$194,531. The estimated annual depreciation reserve has been fixed at \$33,071.50, or at the rate of 17 per cent on the adjusted purchase price of the entire property. However, on the basis of the appraised value of the property, the annual depreciation amounts to 6.28 per cent.

TABLE II—ADJUSTED COSTS AND ANNUAL DEPRECIATION OF PROPERTY PURCHASED AT REFEREE'S SALE

Account	Cost Adjusted to Purchase Price	Annual Rate	Depreciation Amount
Way and structures.....	\$51,400	25	\$12,850
Substation equipment.....	2,820	30	846
25 Second Avenue cars.....	19,100	20	3,820
Eleven other cars.....	1,880	20	376
Materials and supplies.....	1,200	5	60
Buildings.....	16,730	10	1,673
Grounds.....	21,870	..	.....
Total.....	\$115,000		\$19,625

TABLE III—ACTUAL COST AND ANNUAL DEPRECIATION CAPITAL EXPENDITURES SUBSEQUENT TO REFEREE'S SALE

Account	Actual Cost	Annual Depreciation
Way and structures.....	\$1,350	\$67
Six open passenger cars.....	8,463	4,230
Ten safety cars.....	39,500	5,925
One old trailer passenger car.....	25	25
Passenger car motors.....	1,000	200
Shop machinery.....	709	106
Materials and supplies.....	5,174	258
Furniture and fixtures.....	2,004	200
Organization expense.....	20,000	2,000
Miscellaneous.....	1,306	435
Total.....	\$79,531	\$13,446

Although the Transit Commission has looked with favor upon a combined maintenance and depreciation reserve, the results obtained by the New York companies seem to indicate that a better scheme, at least for the Jamaica Central Railways, would be to set aside a definite amount to cover depreciation reserve. With such a method in operation regardless of the maintenance charges, the company would be sure that adequate reserves were being set aside to replace property destroyed or worn out.

Since on any railroad the annual car miles operated should bear a close relation to the value of the property the engineers stated that in their opinion the safest way to accumulate such a reserve is to set aside monthly an amount based on the car miles operated. After a study which indicated that approximately 1,261,000 car miles will be run the first year, it was recommended that 2.62 cents per car mile be reserved from earnings, making a fund of some \$31,000 at the end of the year.

Safety Code for Amusement Parks in Preparation

INITIATION of work on a national safety code for amusement parks, which will include specifications for the construction, operation and inspection of amusement devices, is announced by the American Engineering Standards Committee.

The code, the preparation of which was requested by the National Association of Amusement Parks, is being developed to provide protection for both employees and patrons. While the primary purpose of the work is to provide authoritative rules for voluntary adoption by the industry itself, it is being so carried out that the code may be used in the regulation of amusement parks by public bodies. Accordingly the

national organizations of state and city officials having to do with such matters are officially participating in the preparation of the code.

The code will contain three main parts. The first section will deal with general conditions applicable to all devices and with the special conditions applying to particular devices, namely: to gravity, central pivot, cable driven and loose-car rides (structure, care, brakes, loading); to fun houses; and to walk-through devices. The second and third sections will deal with operations, and with inspection and maintenance, respectively.

The national organizations which are officially co-operating in the formulation of the code through representation on the sectional committee are: Building Officials Conference, National Association of Amusement Parks, National Bureau of Casualty and Surety Underwriters, International Association of Industrial Accident Boards and Commissions, National Safety Council, American Society of Mechanical Engineers, U. S. Department of Labor, International Association of Fairs and Expositions, and the Association of Governmental Labor Officials of the U. S. and Canada.

Highly Meritorious Booklets Issued at Chicago and Montreal

THE Chicago Surface Lines, Chicago, Ill., and the Montreal Tramways Company, Montreal, Canada, have both issued profusely illustrated booklets for educational and advertising purposes. The Chicago Surface Lines Year Book 1925-1926, is a 46-page booklet with a colored frontispiece, "In the Heart of the Shopping District." On Feb. 1 the company entered upon the last year of the franchise period. In many cities, under those circumstances the property has been allowed to deteriorate, but in the case of the Chicago Surface Lines it was never in better condition. More passengers were carried and more miles operated during 1925 than ever before. The growth and the service of the company are outlined with particular attention to the last three years, at which time the properties were just beginning to recover from the effects of the readjustment from war conditions. Their present efficiency is due largely to what has been accomplished since that time. Schedules have been revised to fit changed conditions, and more than 12,000,000 annual car-miles have been added to the service. In that same time 345 new cars have been built or purchased, 95 miles of track have been reconstructed and 15 miles added and a new system has been introduced by which all cars are being overhauled and repainted at the rate of once in two years. Passenger statistics for the year show an increase over 1924 of 24,783,119 rides. The company owns buildings, including among many others 16 operating carhouses, 57 storehouses and sheds, and two clubhouses, to the approximate value of \$20,000,000. Economies have been effected in practically every department with marked increase in efficiency. Six photographs about the shops are reproduced and a great many photographs of different types of cars that have been used during the company's years of service. The booklet ends with a résumé of the constituent companies and their predecessors, an outline of the organization of the company and a list of the officers.

"Public Relations," put out by the Montreal Tram-

ways Company, is frankly an advertising booklet. The company believes in advertising, as it says in the introduction, for three reasons: First, to gain and hold the support of the public; second, to educate the public up to intelligent co-operation with the management of the company; third, to stimulate business. The company served a population of 1,028,000. The total passengers carried during 1925 were 288,212,649. Snow is a factor to be reckoned with in Canada. The average yearly snowfall for the last 40 years was 119 in., and the average cost of snow and ice removal for the last two years was \$425,000. Reproductions of 41 advertisements which have appeared in Montreal newspapers are included. An interesting one shows the way the price of each ticket is spent by the company; the average fare is 6.06 cents; of that 2.73 cents goes for salaries, 1.22 cents for operating expenses, 0.92 cents for interest on money loaned to the company, 0.67 cents to the city of Montreal for taxes, 0.25 cents for taxes other than the city of Montreal, 0.08 cents for the maintenance and renewal fund, 0.19 cents for dividends to stockholders. A map in the center of the book shows the various car routes in greater Montreal.

What One Car Said to Another

One of the Talks Given at Meeting of Women of the Philadelphia Company for Developing Contact with Outside Interests

BY MRS. MARY C. BEST

Pittsburgh Railways, Pittsburgh, Pa.

EDITOR'S NOTE—Growing out of the Contact Club organized some years ago by officers and junior officers of the Philadelphia Company, the holding company operating the Pittsburgh Railways and other utilities in that city, a "sister club" was formed called the "Tact Club." The membership of this organization was limited to secretaries or other women in more responsible positions.

This talk was one of the best given at a recent meeting and is indicative of the work that women can do to promote the welfare of the railway companies providing they are allowed to expand their activities into outside fields.

SOME months ago when I became a member of this club, I was accused of having tried to obtain a position as operator of a one-man trolley car. I denied the charge, but afterwards I said to myself: "Well, I may never have any other kind of car to drive, so why not investigate this proposition of driving a one-man trolley car. It may have possibilities." And myself said to me, "It isn't a bad idea at all. Better look into it."

Since then I have been gradually acquiring some information concerning trolley cars and one night recently I had an exceptionally favorable opportunity. While walking out Craft Avenue past the carhouse, I heard unusual sounds coming from beyond the brick wall surrounding the yard. I listened, and presently discovered that two of the cars were having a little confidential talk over there. So I thought, "Here's a chance to learn something about these cars."

It seemed that a new one-man car was talking in a rather condescending manner to an old worn-out single trucker—one of the last of its race, which happened to be standing on an adjoining track. The dilapidated old car still had some spirit, however. "You need not be so superior," he said. "I know I am just a worn-out dinky, fit only to operate on the Toonerville line, but I

have traveled many a mile in my time and carried many passengers."

"You a traveler," said the new car. "Why, you only came here from McKees Rocks, where you were built. And your longest trip was probably to Kennywood Park. I have already traveled all the way from Boston, Mass., where I was built."

"The men who made me, put into my construction materials from all over the world. They used a design originated by the Pittsburgh Railways, the low-floor, center-entrance type of double truck-car, with four so-called 'baby' motors. Can you imagine 160 horses prancing along the streets with each car? Pittsburgh would look like Red Gulch, Ariz., on a rodeo day. These motors of mine were built by the Westinghouse company here in Pittsburgh, but the iron, steel and copper came from the Great Lakes region in Minnesota. Eight different kinds of wood from the forests of North America form parts of me, and there are also rattan from Java, cotton from the Southern States and rubber from South America."

"As an up-to-date car, I am equipped with the most modern safety devices, so that my operator has less to worry about than when operating other types. These devices include eight wheel brakes, operated by air, but which may be operated by hand in case of necessity, a safety stop light at the rear to warn auto drivers when I am about to stop and the newest type of life guard or fender. I have four sand boxes, so sand will flow from all boxes onto the rail when making an emergency stop. The mechanism which opens and closes my doors is interlocked with my air brake apparatus, so that it is impossible for my doors to be opened without first applying the air brakes, and the operator cannot put on the power to start me without closing the doors. My controller is also equipped with safety devices, so that if the operator removes his hand from my controller without applying his foot to the foot valve, my circuit breaker is knocked out, emergency air and sand applied, and I am brought to a stop in a hurry."

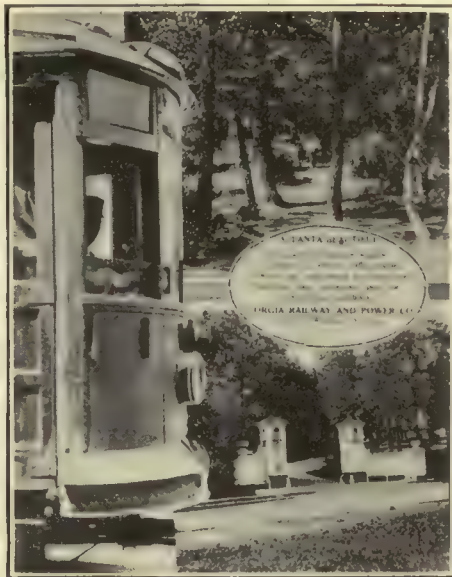
"How interesting," murmured the old car politely. "But tell me, do you like Pittsburgh now that you are here?" "Oh, yes," said the new car. "Life here has its ups and downs, to be sure. To say nothing of its ins and outs, which must be learned by the operator. Also, innings and outings, now that the baseball and picnic season has arrived."

"And do you not find the Pittsburgh climate injurious to your complexion?" asked the old-timer. "You can see how dull and grimy I have become."

"Not at all," answered the one-man car. "You see, the only paint I have ever used is 'Duco,' the new finish which is almost impervious to the effect of climate and has a lovely glossy surface, and a shining exterior being fashionable for cars, though not for noses, I never have to carry a powder puff. Also, since the shops have inaugurated their present repainting schedule, I shall get a new coat of Duco every two years and scrubbed by Mr. Leschke's new shower bath machine ever so often."

The conversation ceased abruptly, for one of those aforesaid valets came along just then. But I hope you will agree with me that operating a one-man car would not be such a bad job and some day, if I can fix it up with the personnel department, you may see me in the operator's cab. Then I shall expect you all to come and take a ride with me.

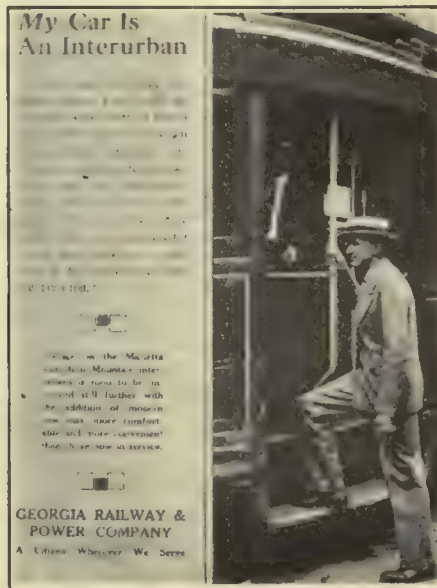
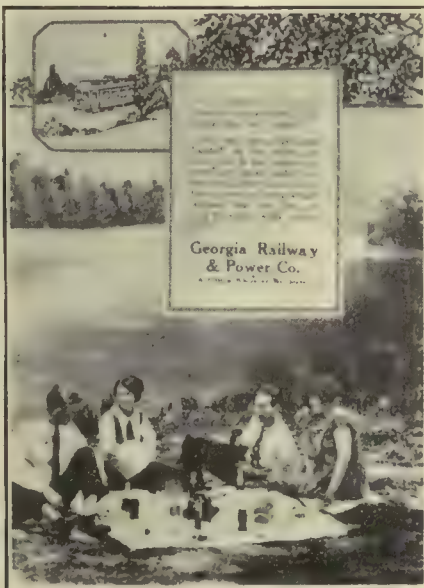
Atlanta Uses Rotogravure Supplements to Advertise Service



ROTOGRAVURE supplements prepared for Sunday newspapers, and sometimes for issues of daily papers on other days than Sunday, have become a well established feature of journalism. The interest which the views in these supplements has for readers gives them an excellent advertising value which many merchants recognize, but the number of railways which have used such media extensively for advertising is limited.

An exception is the Georgia Railway & Power Company, which has included the rotogravure sections of the Atlanta newspapers in a campaign the company has been conducting for the past few months to build up the street car and coach riding habit. The illustrations on this page are reproductions of some of the advertisements placed by the company. As will be noted, they are directed largely to automobile owners, because the company believes that a good source of additional patronage for its cars and buses may be encouraged from this class.

The campaign has been conducted under the direction of L. K. Starr, manager public relations department of the company. Mr. Starr says that while it is impossible to tell exactly what effect these particular advertisements have had, there has been an encouraging increase in the patronage of the two services, following the beginning of the campaign.



Novel Radio Stunt Provides Valuable Advertising

USE of the radio as an advertising medium has been developed in an unusual way by the Northern Texas Traction Company, Fort Worth, Tex. The programs are broadcasted semi-monthly from station WBAP of the Fort Worth *Star-Telegram* and *Record-Telegram*.

In June, 1925, the company first started using the radio, but soon decided that a change from the conventional type of program was needed in order to hold the attention of the unseen audience. Consequently, in January, 1926, an act was inaugurated which was so refreshing in its novelty that a total of 2,612 "fan letters," a record for station WBAP, were received after the first program.

This popular stunt consists in a round trip between Fort Worth and Dallas on the "Crimson Limited," the non-stop interurban train of the company. A specially constructed noise-making device in the studio faithfully reproduces all the sounds made by interurban trains in actual operation over the line, such as the conductor's singal bell, warning gong, motor pick-up, click of wheels, and whistle. With this realistic obligato the announcer describes the passengers, scenery, incidents of the road, etc., with so much enthusiasm that many of the listeners are reported to believe that the program is being broadcasted while the train is actually going over the line. New incidents of the trip are introduced from time to time to give variety to the program.

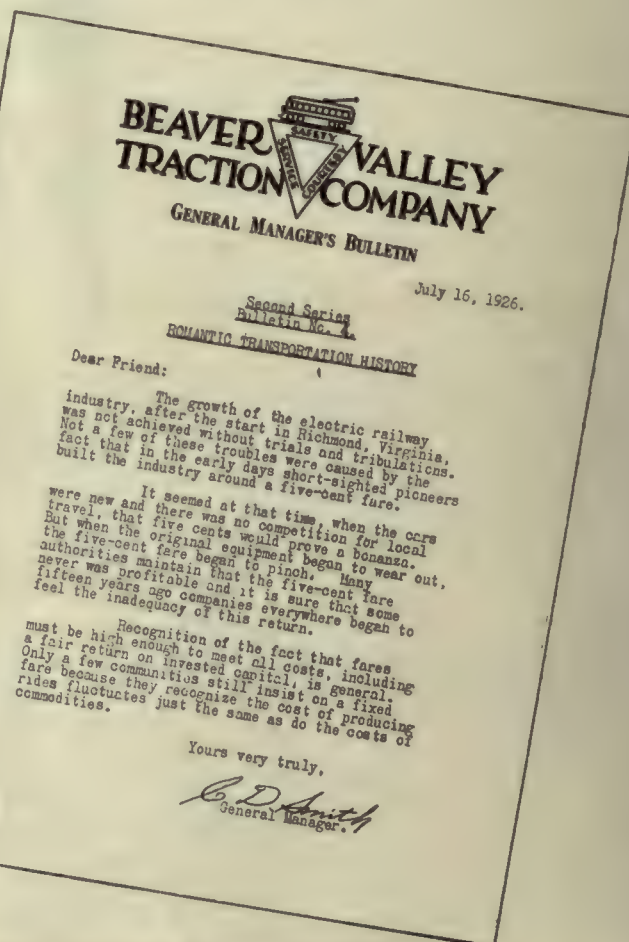
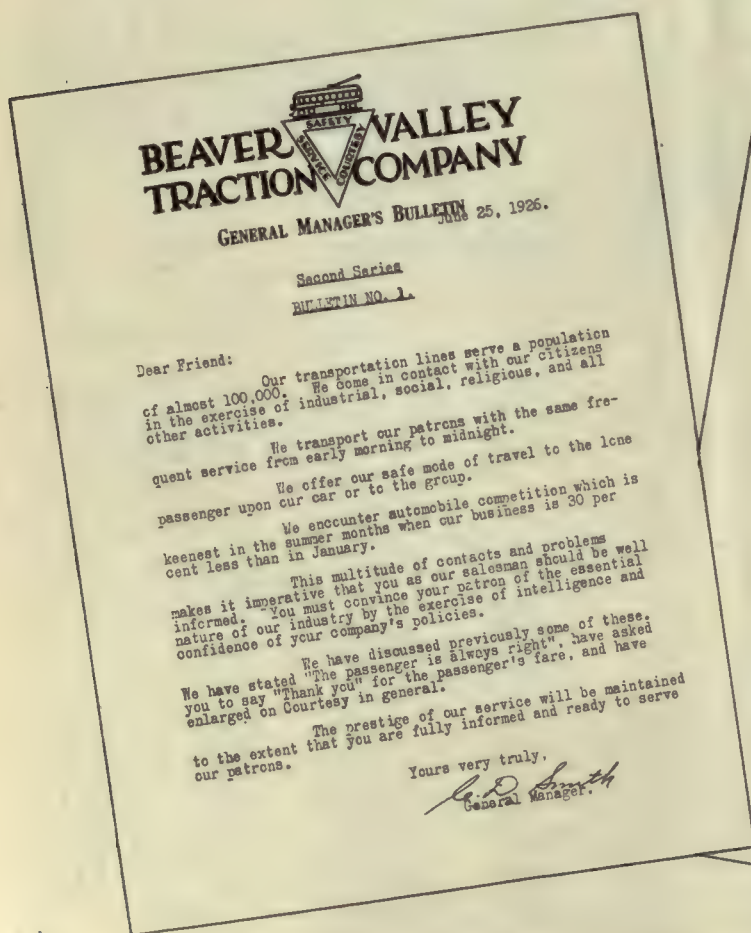
Recently the company erected its own studio, where, in addition to the trip on the "Crimson Limited," entertainment is furnished by three orchestras and various

vocal artists, many of whom are recruited from the company's own employees.

The advertising advantage of these programs is tremendous and varied. In the first place, the emphasis put on efficient and courteous service creates a higher *esprit de corps* among the employees and their families. Moreover, as far as the general public is concerned, the radio not only provides direct contact with the majority of potential patrons, but it also offers an opportunity for follow-up advertising in connection with the mass of "fan mail" which is continually coming in. Every communication is immediately answered by a letter, over the signature of the general passenger agent, containing a souvenir time-table. Thus, by this means the "Crimson Limited" has become known to countless people who could not have been reached by any other method.

Building Good Will with Manager's Weekly Bulletins

WEEKLY bulletins telling of the romantic history of the transportation industry are being issued to employees and friends by the Beaver Valley Traction Company, New Brighton, Pa. Various modern aspects of the business are also explained, in order to give the employees and patrons an insight into the real problems which the company has to face. From the employees' standpoint, the success of the experiment is an interesting justification of the theory that a man can do his job better when he understands why he is doing it. As good will builders among patrons of the company they also play an important role.



Typical General Manager's Bulletins Issued by Clinton D. Smith to Employees and Citizens

Maintenance Notes

Light Weight Car Used for Bond Testing

By A. O. MANGOLD

Electrical Supervisor Southern Pacific System, Beaverton, Ore.

OWING to infrequent interurban train service on the electrified lines of the Southern Pacific Company at Portland, Ore., the testing of bonds by use of the return propulsion current was found to be very inefficient and costly. In order to obtain more reliable results with a saving in labor, we constructed, at the Beaverton shops, a portable testing car, which, after a year's service, has proved very successful. The cost of testing rail bonds has been reduced 65 per cent, and we have been able more accurately to determine the condition of the bonds than was possible before.

The bond testing car is very light and is easily propelled and operated. Its total weight is but 124 lb. and the car less battery weighs but 80 lb. It consists of a wood frame supporting a series of contacts for each rail, which are raised and lowered from the operating position by two small levers. Five saw-blade contacts are provided on each side, the two outer ones being connected through a switch on the instrument



Top View of the Bond Testing Car with Instrument and Battery in Place

table to an Edison storage battery, which provides a flow of current when necessary across the joint to be tested. The remaining three contacts on each side are connected to a Roller-Smith direct reading bond tester in the usual way. In testing a bond the car is rolled over the joint so that the word BOND, which is stenciled on the operating rod, is over the center of the plate, and the contacts are lowered on that side by the operating lever. If sufficient propulsion current is flowing in the rail to give a good indication on the instrument a reading is taken and recorded on the report sheet carried on the shelf beside the instrument. The contacts are then raised by the lever and the car is moved to the next joint. However, should there

be no propulsion current flowing, or an insufficient amount to actuate the instrument galvanometer, the push switch is depressed and the battery provides the necessary current. It has been found that the saw blade contacts offer just the right resistance in the power circuit to limit the current to 15 amp., which gives a good reading on the bond tester. The battery holds up very well for 10 to 12 miles of testing.

It was necessary to produce a car that would not be classified as a loaded push car and be subject to the transportation rules, which would limit its usefulness. The car had to be light in weight, yet strong enough to carry the equipment and stand service on the rails. It had to be simple, quick to set up and knock down and easy to operate. It also had to be very compact when disassembled so that it could be handled on passenger equipment or on light motor cars, and so it could be easily removed from the track by one man.

The car and its equipment were made light enough to be easily lifted from the track by one man, which takes it out of the "loaded push car" class. Lightness and strength were obtained by making the entire frame of spruce reinforced by wrought iron where necessary. The wood frame also provides insulation between the rails, so the car can be used in signal zones without operating the signals. An Edison battery was used on account of its ruggedness and light weight.

Simplicity in assembling and disassembling the outfit was obtained by having most of the folding parts hinged together and the wiring cable provided with plug and socket connectors, plainly marked so that errors in connections would be avoided. Compactness was obtained by arranging the folded parts so that very little space is necessary for storage. The two main parts (sides folded) can be stood up in the corner of a passenger car or laid along the tie rods of a motor car. Concentration of the weight of instrument and battery at the rear end of the car enables the operator to lift the entire outfit from the rails should necessity arise.



The Test Car Is Rolled Over the Joint to Be Tested and the Operator Takes a Reading on the Instruments



The Test Car Folds Up so as to Take Little Space in Storage

The electrified lines on the Portland division included a signal zone 20 miles in length that formerly required two men from twelve to fourteen days to test, and then with very unreliable results, as the tester was found to work best only when trains were in the immediate vicinity of the testing crew. The time of the men in between trains was practically lost. Signal failures due to defective bounding were frequent.

With the new testing car and outfit this same section of track is now covered in four to five days with accurate readings obtained at each joint. No signal failures have resulted from defective bonds since the car was placed in service.

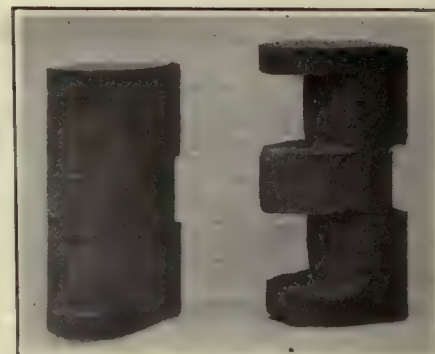
A glass cover constructed for the instrument makes the car usable in all kinds of weather. The apparatus was designed and constructed by the Southern Pacific Company at its Beaverton shops under the direction of R. D. Young, shop foreman, and the writer.

Special Steel Used for Wear Blocks of Swing Links

BOLSTER swing link bearing blocks are subjected to rather hard service. On the trucks of cars operated by the New York, Westchester & Boston Railway hardened

steel wearing blocks were used originally and a service of from eight to ten months was obtained before these were worn to such an extent as to require replacement. The company is now using Nuttall B.P. process steel for these swing link bearings and a much longer service is obtained.

The accompanying illustration shows two wearing blocks which have been in service the same length of time. The one on the left is of B.P. process steel, while that on the right is of special hardened steel, of the type previously used. The one on the right has worn to such an extent that it is necessary to replace it, while very slight wear has occurred on the wearing block shown at the left.



These Two Bolster Swing Link Wearing Blocks Have Had the Same Service

The one on the right, made of hardened steel, has worn so that replacement is necessary. The one on the left, made of B.P. process steel, shows very little wear.

Steel Cabinet for Storing Open Paint

UNUSED odds and ends of paints and oils left around a paint shop not only look untidy but are an extreme fire hazard. The illustration shows a four-door steel cabinet designed and built in the Chattanooga Railways shop for keeping open paints and oils. The walls and doors are constructed of steel plates stiffened by small structural shapes that have been welded to the plates. At night all opened cans of paint and oils generally found around a car paint shop are stored away and the doors locked. The shelves in the cabinet to the right are recessed

Preventing Splitting of Wooden Dust Guards

IN MAKING dust guards of wood, the Department of Street Railways, Detroit, Mich., found a tendency for the wood to check and split along the grain. This tendency has been overcome by placing a piece of tin across the end, so that it extends lengthwise across the grain of the wood. This has effectively prevented the trouble. An accompanying illustration shows a storage rack with dust guards of this construction.



Wooden Dust Guards Are Constructed with Tin Reinforcing Strips at the End to Prevent Splitting When Installed in Motors in the Department of Street Railways, Detroit, Mich.



Steel Cabinet Built by the Chattanooga Railway Shop for the Storage of Paints and Oils in Use in the Painting of Cars

slightly to allow the steel table to be folded up and the door closed over it. Only clean rags are kept in the cabinet in the bin on the left. All oily rags are burned at the close of the day. Self-closing waste cans are provided for other trash. This arrangement is not only a precaution

against fire but also makes it possible to keep the paint shop in the same immaculate condition as the rest of the shop.

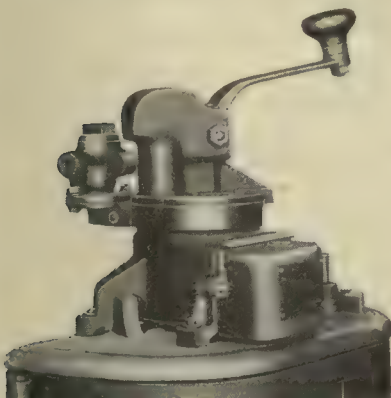
The Chattanooga Railway is part of the Tennessee Electric Power Company recently placed under Hodenpyl-Hardy management.

New Equipment Available

Handle Switch Prevents Burned Fingers

TO REPLACE the ratchet switch used for controlling the line switch on "K" controllers, the Westinghouse Electric & Manufacturing Company has developed the type "TA" handle switch. It makes use of a 24-deg. lost motion between the handle and the controller drum, to insure the operation of the line switch before the main controller drum is moved.

As the controller is notched up,



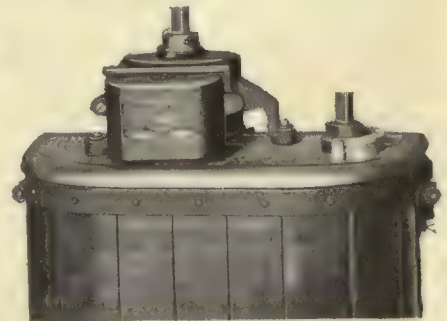
Handle Switch Applied with Standard Safety Device

the handle first passes through the angle of lost motion, closing the contact in the line-switch control circuit. The control circuit is completed on the first notch through the spot ground contact and is completed on all other positions through the line switch interlock. As the controller is notched off the handle passes through the lost motion, breaking the control circuit and dropping out the line switch before the drum moves. This reduces the controller maintenance expense, as there is little or no burning of the controller fingers, contacts and arc barriers. The operation of the handle switch is the same as the ratchet switch in so far as the overload trip is concerned.

Standard safety device handles used in conjunction with dead-man control can be used with the TA switch without any modification of the dead-man attachment or the switch. The switch is mounted well within the dimensions of the cap plate. This is accomplished without modification of the cap plate, handle switch or controller handle, except for the drilling and tapping of the mounting holes. In most

cases no machining is necessary either inside or outside of the controller. The only requirement necessitating work inside the controller is adding the spot ground contact and finger, in case these are not already mounted in the controller. The location of the device on top of the cap plate makes it accessible for inspection, all working parts being reached by removing the cover plate.

The original "K" controller handle can be used with the handle switch, making it unnecessary for the operating company to duplicate this part. To add to the convenience of operation, however, a new low-type knob grip has been developed. This flat top grip seems to be more restful and has met with general approval among the operators who have used it. The total height of the handle above the cap plate, with the new low knob,



Westinghouse TA Handle Switch Applied on Standard "K" Controller

is 10 $\frac{3}{4}$ in. for the standard high type "K" controller handle, and 9 $\frac{3}{4}$ in. for the standard low type handle. In further refinement, the manufacturer has produced a handle the total height of which is 7 $\frac{1}{4}$ in. above the cap plate.

Tractor Welders Now Available

ELECTRIC arc welding equipment assembled in a complete unit with gas-engine drive is being brought out by the General Electric Company, Schenectady, N. Y. The equipment can be mounted on Fordson tractors for portable use at points remote from power lines. The General Electric Company does not market the complete outfit.

In such a combination, the same gas engine drives both the tractor and the generator which supplies the current for the welding electrodes. The tractor is equipped with rubber tires and can be driven to the job at a speed of from 15 to 18 m.p.h. The belt is then connected to the generator and the outfit is ready for welding operations.

American Association News

Program for Cleveland Convention Announced

PREPARATION for the meetings of the American Electric Railway Association and its affiliated associations at the Cleveland convention, Oct. 4-8, are rapidly nearing completion. Sessions of the American Association will be held in the mornings of Monday, Tuesday and Thursday. Those of the affiliated associations will be held in the afternoons of the same days.

All day Wednesday and Friday morn-

ing have been set aside for inspection of the exhibits. Friday afternoon will be devoted to inspection trips to plants of near-by manufacturers.

All meetings will be held at the Cleveland Public Auditorium and annex, East Sixth Street, between Lakeside and St. Clair Avenues.

Following are the tentative programs for the meetings, as revised by association headquarters to Aug. 27:

AMERICAN ASSOCIATION

Monday Morning, October 4

9 A.M. TO 10 A.M.

REGISTRATION AND DISTRIBUTION OF BADGES at booths at entrance to Cleveland Public Auditorium.

10 A.M. TO 1 P.M.

Meeting Held in West Wing of Auditorium

General Topic: Unified Transportation Service in the Public Interest.

ADDRESS OF WELCOME.

ADDRESS OF PRESIDENT.

ADDRESS—"Selling the Service—Intercity," by Britton I. Budd, president Chicago Rapid Transit Company, Chicago.

ADDRESS—"Selling the Service—City," by Thomas Fitzgerald, vice-president Pittsburgh Railways, Pittsburgh, Pa.

ADDRESS—"Modern Equipment," by Samuel M. Curwen, president the J. G. Brill Company, Philadelphia, Pa.

ADDRESS—"The Car—Show Window of the Industry," by Edwin B. Meissner, president and general manager St. Louis Car Company, St. Louis, Mo.

ADDRESS—"Manufacturer Co-operation," by E. F. Wickwire, vice-president the Ohio Brass Company, Mansfield, Ohio.

Discussion.

Tuesday Morning, Oct. 5

10 A.M. TO 1 P.M.

Meeting Held in West Wing of Auditorium

General Topic: Street Congestion—Let's Reduce It.

REPORT OF COMMITTEE ON NOMINATIONS AND ELECTION OF OFFICERS.

ADDRESS—"Progress and Trends During Year," by Lucius S. Storrs, managing director American Electric Railway Association, New York, N. Y.

ADDRESS—"The High Cost of Congested Streets," by Col. C. O. Sherrill, city manager, Cincinnati, Ohio.

ADDRESS—"The Business of Street Management," by G. B. Anderson, man-

ager of transportation Los Angeles Railway, Los Angeles, Cal.

ADDRESS—"Provide Now for Future Transportation," by Col. Sidney D. Waldon, president Rapid Transit Commission, Detroit, Mich.

ADDRESS—"Co-operation and Traffic Control," by R. F. Kelker, Jr., Kelker, De Leuw & Company, engineers, Chicago, Ill.

Discussion.

Tuesday Evening, Oct. 5

General Evening Session

9 P.M.

Arena Floor of Auditorium

MEETING UNDER AUSPICES OF THE ADVISORY COUNCIL.

OPENING ADDRESS by B. C. Cobb, vice-president Hodenpyl, Hardy & Company, Inc., New York, N. Y., chairman Advisory Council.

ADDRESS—"The Public Service—Its Obligations and Rewards" (speaker to be announced later).

AWARD OF CHARLES A. COFFIN PRIZE—F. R. Coates, Henry L. Doherty & Company, New York, N. Y., president American Electric Railway Association.

ADDRESS OF ACCEPTANCE.

INFORMAL DANCING.

Wednesday, Oct. 6

This entire day has been set aside by the officers of the association for the inspection of manufacturers' exhibits. No formal convention sessions of the

American Association or the affiliated associations will be held.

The official business of the day is the inspection of exhibits and every delegate is urged to take advantage of the opportunity to visit the manufacturers' booths, where the most modern equipment and latest appliances are on display.

Thursday Morning, Oct. 7

10 A.M. TO 1 P.M.

Meeting Held in West Wing of Auditorium

General Topic: New Capital, Where and How to Get It.

ADDRESS—"Modern Management and Operation," by R. F. Carbutt, Henry L. Doherty & Company, New York, N. Y.

ADDRESS—"Electric Railway Financing," by H. L. Stuart, president Halsey, Stuart & Company, Inc., Chicago, Ill.

ADDRESS—"Intercity Business Possibilities," by T. A. Kenney, Hodenpyl, Hardy & Company, Inc., New York, N. Y.

ADDRESS—"Provide Now for Future Transportation," by Alfred H. Swayne, vice-president General Motors Company, New York, N. Y.

ADDRESS—"Industrial Education," by Edward Dana, general manager Boston Elevated Railway, Boston, Mass.

DEMONSTRATION—"Foremen's Conference," conducted by H. H. Norris, educational director Boston Elevated Railway, Boston, Mass.

General Discussion.

AWARD—*Forbes Magazine* Public Relations Contest.

AWARD—*Electric Traction* Speed Contest.

REPORTS OF SPECIAL COMMITTEES.

UNFINISHED BUSINESS.

NEW BUSINESS.

INSTALLATION OF OFFICERS.

ADJOURNMENT.

Friday Morning, Oct. 8

10 A.M. TO 12 NOON

Inspection of Manufacturer's Exhibits.

AFTERNOON

Inspection of Local Manufacturing Plants.

ACCOUNTANTS' ASSOCIATION

Monday Afternoon, Oct. 4

2 P.M. TO 4:30 P.M.

Meeting Held in Room E-251, Mezzanine Floor, Auditorium

ADDRESS OF WELCOME—By Urban F. von Rosen, C. P. A., accountant for the City Street Railroad Commissioner, Cleveland, Ohio.

ANNUAL ADDRESS OF THE PRESIDENT.

ANNUAL REPORT OF THE EXECUTIVE COMMITTEE.

ANNUAL REPORT OF THE SECRETARY-TREASURER.

APPOINTMENT OF CONVENTION COMMITTEES ON (a) Resolutions; (b) Nominations.

REPORT OF COMMITTEE ON BUS ACCOUNTING—M. W. Glover, general auditor West Penn Railways, Pittsburgh, Pa., chairman.

Discussion.

REPORT OF COMMITTEE ON STANDARD CLASSIFICATION OF ACCOUNTS—M. W. Glover, general auditor West Penn Railways, Pittsburgh, Pa., chairman.

Discussion.

ADDRESS—"The Accountant," by Carl H. Nau, C. P. A., president, Nau, Rusk & Swearingen, certified public accountants, Cleveland, Ohio.

Tuesday Afternoon, Oct. 5

2 P.M. TO 4:30 P.M.

Meeting Held in Lecture Room, Exhibition Hall, Auditorium

Joint Session 2 p.m. to 3 p.m. Accountants' and Engineering Associations.

REPORT OF JOINT COMMITTEE ON ENGINEERING ACCOUNTING—T. B. Mac Rae, general auditor Chicago Rapid Transit Company, Chicago, Ill., and Robert B. Rifenberick, consulting engineer, Toledo, Ohio, co-chairmen.

Discussion.

ADDRESS—"A Message on Depreciation," by Henry E. Riggs, professor of civil engineering University of Michigan, Ann Arbor, Mich.

Discussion.

At the close of the discussion of the above paper, the members of the Accountants' Association will adjourn to their own meeting room (E-251), where the Accountants' Session will be continued.

REPORT OF COMMITTEE ON STORES ACCOUNTING—R. A. Weston, special accountant The Connecticut Company, New Haven, Conn., chairman.

Discussion.

REPORT OF COMMITTEE ON FARE COLLECTION—E. A. Tuson, general auditor Public Service Railway, Newark, N. J., chairman.

*Discussion.***Wednesday, Oct. 6**

This entire day has been set aside by the officers of the association for the inspection of manufacturers' exhibits. No formal convention sessions of the American Association or the affiliated associations will be held.

The official business of the day is the inspection of exhibits and every delegate is urged to take advantage of the opportunity to visit the manufacturers' booths, where the most modern equipment and latest appliances are on display.

"GET TOGETHER LUNCHEON" at 12:30 at one of the hotels. This is to be an informal gathering of accountants and railway men interested in accounting subjects for the purpose of becoming better acquainted.

Thursday Afternoon, Oct. 7

2 P.M. TO 4:30 P.M.

Meeting Held in Room E-251, Mezzanine Floor, Auditorium

REPORT OF COMMITTEE REPRESENTING THE ACCOUNTANTS' ASSOCIATION AT THE ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF RAILWAY AND UTILITY COMMISSIONERS—W. L. Davis, auditor Lehigh Valley Transit Company, Allentown, Pa., chairman.

Discussion.

REPORT OF THE COMMITTEE ON

FREIGHT ACCOUNTING—O. H. Bernd, Secretary Des Moines City Railway, Des Moines, Ia., chairman.

Discussion.

REPORT OF COMMITTEE TO REVIEW THE PROCEEDINGS OF THE ACCOUNTANTS' ASSOCIATION—J. E. Heberle, assistant to the president, the Capital Traction Company, Washington, D. C., chairman.

Discussion.

ADDRESS—"Income Taxes," by Albert F. Elkins, manager Peat, Marwick,

Mitchell & Company, certified public accountants, Cleveland, Ohio.

Discussion.

REPORTS OF CONVENTION COMMITTEES: (a) Resolutions; (b) Nominations.

ELECTION OF OFFICERS.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST-PRESIDENT'S BADGE.

INFORMAL ROUND-TABLE DISCUSSION OF ACCOUNTING MATTERS.

ADJOURNMENT.

CLAIMS ASSOCIATION**Monday Afternoon, Oct. 4**

2 P.M. TO 5:30 P.M.

Meeting Held in Second Floor Lounge, Auditorium

READING OF MINUTES OF PREVIOUS MEETING.

ANNUAL ADDRESS OF PRESIDENT.

ANNUAL REPORT OF EXECUTIVE COMMITTEE.

ANNUAL REPORT OF SECRETARY-TREASURER.

APPOINTMENT OF THE NOMINATING COMMITTEE.

ADDRESS—"Accident Prevention and Claims," by Charles B. Scott, president National Safety Council, Chicago, Ill.

PAPER—"Methods of Discouraging Litigation in Accident Claims," by Trevor C. Neilson, claim agent East St. Louis & Suburban Railway, East St. Louis, Ill.

PAPER—"Automobile Claims and Methods of Handling Them Where Insurance Companies Are Involved," by William G. Marshall, superintendent of claims, Pittsburgh Railways, Pittsburgh, Pa.

PAPER—"Bonus System—Its Value in Claim Work," by G. T. Hellmuth, claims attorney Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.

PAPER—"Bus Accidents—Their Causes and Successful Methods of Prevention," by H. V. Drown, general claim agent Public Service Railway, Newark, N. J.

*Discussion.***Tuesday Afternoon, Oct. 5**

2 P.M. TO 5:30 P.M.

Meeting Held in West Wing of Auditorium

JOINT SESSION, CLAIMS AND TRANSPORTATION & TRAFFIC ASSOCIATIONS.

REPORT OF COMMITTEE ON TRAFFIC CONGESTION—A. R. Myers, president Erie Railways, Erie, Pa., chairman.

FORMAL DISCUSSION—By a traffic captain, a traffic engineer, a consulting engineer and a railway operating engineer.

GENERAL DISCUSSION.

REPORT OF JOINT COMMITTEE ON ACCIDENT PREVENTION—M. W. Bridges, safety engineer Chicago Rapid Transit Company, Chicago, Ill., and H. K. Bennett, safety manager United Electric Railways, Providence, R. I., co-chairmen.

FORMAL DISCUSSION by Claims men and Transportation men.

GENERAL DISCUSSION.

Wednesday, Oct. 6

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Thursday Afternoon, Oct. 7

2 P.M. TO 5:30 P.M.

Meeting Held in Second Floor Lounge, Auditorium

PAPER—"Motion Pictures as a Means of Combating Fraudulent Suits," by C. M. McRoberts, General Claim Agent, Los Angeles Railway Corporation, Los Angeles, Cal.

REPORT OF COMMITTEE ON MEDICAL AND SURGICAL WORK—Dr. Frederick L. Mosser, surgeon Third Avenue Railway System, New York, N. Y., chairman.

PAPERS—"Practical Methods of Obtaining Greater Efficiency from the Medical Departments of the Street Railway Companies," by Dr. Frederick L. Mosser, surgeon Third Avenue Railway System, New York, N. Y.; Dr. Hart E. Fisher, Chief Surgeon, Chicago Rapid Transit Company.

PAPER—"Observation on the Physical Examination of Electric Railway Employees," by Doctor Benjamin E. Sibley, surgeon Boston Elevated Railway, Boston, Mass.

PAPER—"The Uses and Value of Medical Testimony," by Dr. H. Stuart MacLean, chief surgeon Virginia Electric & Power Company, Richmond, Va.

PAPER—"Health Service Examination and Organization of a Medical Staff for the Care of Injured Patrons of a Public Utility," by Dr. Ernest W. Miller, surgeon Milwaukee Electric Railway & Light Company.

PAPER—"Should Industrial Surgery Be Done by Industrial Surgeons?" by Dr. Arthur S. Driscoll, surgeon Richmond Light & Railroad Company, Staten Island, New York, N. Y.

REPORT OF COMMITTEE ON RESOLUTIONS.

REPORT OF COMMITTEE ON NOMINATIONS.

ELECTION OF OFFICERS.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST-PRESIDENT'S BADGE.

ADJOURNMENT.

ENGINEERING ASSOCIATION

Monday Afternoon, Oct. 4

2 P.M. TO 5:30 P.M.

*Meeting Held in Lecture Room,
Exhibition Hall, Auditorium*

General Subject: Way and Structures.

ADDRESS OF PRESIDENT.

REPORT OF EXECUTIVE COMMITTEE.

REPORT OF SECRETARY-TREASURER.

REPORTS OF SPECIAL WAY AND STRUCTURES COMMITTEES:

Review of Engineering Manual—W. R. Dunham, Jr., executive engineer department of street railways, Detroit, Mich., chairman.

Design of Switch Tongues and Hard Centers for Special Trackwork (progress report)—E. M. T. Ryder, way engineer Third Avenue Railway System, New York, N. Y., chairman.

CO-OPERATION WITH WELDED RAIL JOINT COMMITTEE—W. W. Wysor, chief engineer United Railways & Electric Company, Baltimore, Md., chairman.

Discussion.

Surface Hardening of Rails—A. T. Spencer, assistant to general manager Toronto Transportation Commission, Toronto, Canada, chairman.

Discussion.

Design of Steam and Electric Railway Crossings—*V. Angerer, vice-president William Wharton, Jr. & Company, Inc., Easton, Pa., chairman.

Arc Welding Processes for Repairs to Rails and Manganese Steel (progress report)—Chester F. Gailor, consulting engineer, New York, N. Y., chairman.

Discussion.

Design of Buildings for Maintenance, Storage and Operation of Buses, and Design of Joint Railway and Bus Terminals—John R. McKay, chief engineer Indiana Service Corporation, Fort Wayne, Ind., chairman.

Discussion.

ELECTRIC RAILWAY CARHOUSES AND CARS—H. E. Bachman, superintendent of distribution Public Service Railway, Newark, N. J., chairman.

REPORT OF STANDING COMMITTEE ON WAY AND STRUCTURES—H. H. George, assistant to chief engineer, Public Service Production Company, Newark, N. J., chairman.

REPORT OF SPECIAL COMMITTEE ON RAIL CORRUGATION (progress report)—W. W. Wysor, chief engineer United Railways & Electric Company, Baltimore, Md., chairman.

Discussion.

REPORT OF COMMITTEE ON WOOD PRESERVATION—A. P. Way, engineering department, American Electric Power Company, Philadelphia, Pa., chairman.

Discussion.

Tuesday Afternoon, Oct. 5

2 P.M. TO 5:30 P.M.

*Meeting Held in Lecture Room,
Exhibition Hall, Auditorium*

Joint Session 2 p.m. to 3 p.m., Engineering and Accountants' Associations.

General Subject: Equipment

REPORT OF JOINT COMMITTEE ON ENGINEERING ACCOUNTING—Robert B. Rifenberick, consulting engineer, Toledo, Ohio, and T. B. MacRae, auditor Chicago Rapid Transit Company, Chicago, Ill., co-chairmen.

*Deceased, May 5, 1926.

ledo, Ohio, and T. B. MacRae, auditor Chicago Rapid Transit Company, Chicago, Ill., co-chairmen.

Discussion.

ADDRESS—"A Message on Depreciation," by Henry E. Riggs, professor of civil engineering, University of Michigan, Ann Arbor, Mich.

Discussion.

At the close of the discussion of the above paper the members of the Accountants' Association will adjourn to their own meeting room to continue their regular program, the engineers remaining in the Lecture Room where the Engineering Association will be continued.

REPORTS OF COMMITTEES:

Engineering Symbols—H. W. Codding, assistant engineer Public Service Production Company, Newark, N. J., chairman.

Discussion.

Engineering Manual—Charles R. Harte, construction engineer The Connecticut Company, New Haven, Conn., chairman.

Discussion.

Heavy Electric Traction—H. F. Brown, assistant electrical engineer, New York, New Haven & Hartford Railroad, New Haven, Conn., chairman.

Discussion.

Equipment—P. V. C. See, superintendent car equipment Northern Ohio Power & Light Company, Akron, Ohio, chairman.

Discussion.

Unification of Car Design—H. H. Adams, superintendent shops and equipment, Chicago Surface Lines, Chicago, Ill., chairman.

Discussion.

Reduction of Noise in Car Operation—H. S. Williams, assistant superintendent of equipment Department of Street Railways, Detroit, Mich., chairman.

Discussion.

Wheel Mounting and Check Gauges—C. W. Squier, associate editor ELECTRIC RAILWAY JOURNAL, New York, N. Y., chairman.

Discussion.

Tuesday Afternoon, Oct. 5

2 P.M. TO 4 P.M.

PURCHASING AGENTS AND STOREKEEPERS

Session held under the auspices of the Committee on Purchases and Stores, Engineering Association.

Meeting Held in Room D-245, Mezzanine Floor, Auditorium

ADDRESS OF WELCOME by Charles R. Harte, president American Electric Railway Engineering Association.

INFORMAL TALK—Frank R. Coates, president American Electric Railway Association.

REPORT OF COMMITTEE ON PURCHASES AND STORES—P. F. McCall, manager of commissary, Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., chairman.

REPORTS OF OTHER COMMITTEES.

Discussion of committee reports.

ADDRESS—"Co-ordination of Operating Budget with Purchases of Material," by Dr. Charles Reitel, head of department of Accounting and Industry, University of Pittsburgh.

ADDRESS—"The Relation of Purchases and Stores to the Utility Business," by William E. Wood, vice-president Virginia Electric & Power Company, Richmond, Va.

ADDRESS—"Saving in Time Which Could Be Made If Purchasers of Materials Would Supply Full Catalog Information When Ordering Equipment Supplies," by Henry S. Day, manager transportation division Westinghouse Electric & Manufacturing Company, Boston, Mass.

General Discussion.

Wednesday, Oct. 6

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Thursday Afternoon, Oct. 7

2 P.M. TO 5:30 P.M.

Meeting Held in Lecture Room, Exhibition Hall, Auditorium

General Subject: Power.

REPORTS OF COMMITTEES:

Power Generation and Conversion—L. D. Bale, superintendent of power, The Cleveland Railway, Cleveland, Ohio, chairman.

Discussion.

Power Transmission and Distribution—Charles H. Jones, general manager Chicago, South Shore & South Bend Railroad, Chicago, Ill., chairman.

Discussion.

Automatic Substations—Adrian Hughes, Jr., superintendent of bus transportation United Railways & Electric Company, Baltimore, Md., chairman.

Discussion.

Purchases and Stores—P. F. McCall, manager of commissary, Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., chairman.

Discussion.

Committee to Co-operate with the U. S. Department of Commerce on Simplification and Standardization—R. H. Dalglish, chief engineer Capital Traction Company, Washington, D. C.

REPORT OF REPRESENTATIVES ON THE MAIN COMMITTEE OF THE AMERICAN ENGINEERING STANDARDS COMMITTEE—Charles R. Harte, construction engineer, the Connecticut Company, New Haven, Conn., and R. H. Dalglish, chief engineer the Capital Traction Company, Washington, D. C., representatives.

REPORT OF COMMITTEE ON NOMINATIONS—L. C. Datz, care of Newman Saunders & Company, Inc., St. Louis, Mo., chairman.

Discussion.

ELECTION OF OFFICERS.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST PRESIDENTS' BADGES.

ADJOURNMENT.

TRANSPORTATION AND TRAFFIC ASSOCIATION

Monday Afternoon, Oct. 4

2 P.M. TO 5:30 P.M.

Meeting Held in West Wing of Auditorium

ANNUAL ADDRESS OF PRESIDENT.

ANNUAL REPORT OF EXECUTIVE COMMITTEE.

ANNUAL REPORT OF SECRETARY-TREASURER.

APPOINTMENT OF CONVENTION COMMITTEE ON RESOLUTIONS.

REPORT OF COMMITTEE ON NOMINATIONS.

ELECTION OF OFFICERS.

REPORT OF COMMITTEE ON MERCHANDISING TRANSPORTATION. This report is treated under six general headings and will be presented as follows:

1. *Courtesy, Salesmanship and Appearance of Transportation Employees*—R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, Youngstown, Ohio, chairman.

2. *Special Classes of Service and Rates of Fare*—C. D. Smith, general manager Beaver Valley Traction Company, New Brighton, Pa.

3. *Maximum Use of Existing Facilities*—S. E. Emmons, assistant general manager United Railways & Electric Company, Baltimore, Md.

4. *General Company Interest in Civic Problems*—J. B. Donley, director of public relations, Pittsburgh Railways, Pittsburgh, Pa.

5. *Advertising*—A. C. Spurr, general manager Wheeling Traction Company, Wheeling, W. Va.

6. *Design and Care of Equipment*—John A. Dewhurst, associate editor ELECTRIC RAILWAY JOURNAL, New York, N. Y.

Discussion.

PUBLICITY SHOP TALK

Series of talks by practical railway and advertising men.

Tuesday Afternoon, Oct. 5

2 P.M. TO 5:30 P.M.

Meeting Held in West Wing of Auditorium

JOINT SESSION, TRANSPORTATION AND TRAFFIC AND CLAIMS ASSOCIATIONS.

REPORT OF COMMITTEE ON TRAFFIC CONGESTION—A. R. Myers, president Erie Railways, Erie, Pa., chairman.

Formal Discussion by a traffic captain, a traffic engineer, a consulting engineer and a railway operating engineer.

GENERAL DISCUSSION.

REPORT OF JOINT COMMITTEE ON ACCIDENT PREVENTION—M. W. Bridges, safety engineer Chicago Rapid Transit Company, Chicago, Ill., and H. K. Bennett, safety manager United Electric Railways, Providence, R. I., co-chairmen.

Formal Discussion by transportation men and claims men. (Names to be announced later.)

GENERAL DISCUSSION.

Wednesday, Oct. 6

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Thursday Afternoon, Oct. 7

2 P.M. TO 5:30 P.M.

Meeting Held in West Wing of Auditorium

REPORT OF COMMITTEE ON BUS OPERATION.

This report is treated under fourteen general headings and will be presented as follows:

1. *Introduction*—J. B. Stewart, Jr., general manager Cincinnati Street Railway, Cincinnati, Ohio, chairman.

2. *Rates of Fare—Interurban*—E. D. Dreyfus, advisory engineer West Penn Railways, Pittsburgh, Pa., and D. A. Scanlon, general superintendent of railways, Northern Ohio Power & Light Company, Akron, Ohio.

3. *Taxation During Development Period*—C. B. Cooke, Jr., president Westchester Street Railway, Philadelphia, Pa.

4. *Proper Agency to Operate Buses in Competitive Territory—Steam or Electric Railroads*—A. Shapiro, assistant general manager Washington Rapid Transit Company, Washington, D. C.

5. *Terms of Franchise*—S. W. Greenland, care of Newman, Saunders & Company, St. Louis, Mo.

6. *Chartered Coach and Bus Operations*—Adrian Hughes, Jr., superintendent of bus transportation, United Railways & Electric Company, Baltimore, Md.

7. *Package Express Delivery, Including Handling of U. S. Mail*—R. B. Hill, superintendent of operation Los Angeles Railway, Los Angeles, Cal.

8. *Utilization of Motor Buses in Developing Better Public Relations*—C. H. Chapman, manager The Connecticut Company, Waterbury, Conn.

9. *Problems of Supporting Non-paying Route Extensions*—R. H. Smith, Electric Bond & Share Company, New York, N. Y.

10. *Underlying Reasons for Better Service at Higher Rates of Fare*—D. L. Fennell, superintendent of transportation Kansas City Railways, Kansas City, Mo.

11. *Steps to Be Taken to Protect Rate Base with Respect to Development Expense*—A. T. Warner, assistant to vice-president in charge of operation Public Service Railway, Newark, N. J.

12. *Tire Mileage Contracts*—M. L. Harry, division manager Illinois Power & Light Corporation, Decatur, Ill.

13. *Liability Insurance*—R. N. Graham, manager of railways, Pennsylvania-Ohio Electric Company, Youngstown, Ohio.

14. *Double-Deck Bus Operations*—B. W. Arnold, assistant general manager Chicago, North Shore & Milwaukee Railroad, Milwaukee, Wis.

REPORT OF COMMITTEE ON RESOLUTIONS.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST PRESIDENT'S BADGE.

ADJOURNMENT.

Inspection of Manufacturing Plants Being Arranged

PURSUANT to requests from railway operators and engineers, various manufacturers in the Cleveland district are planning inspection trips through their factories at the time of the annual convention. Several of the manufacturers, in advising the association of their plans, stated that they did not wish to do anything which would be detrimental to the attendance at either the convention meetings or the convention exhibit. They therefore suggested that a definite time be designated for such inspection trips.

The executive committee of the association discussed the situation and voted that no inspection trips should be planned until 12 o'clock noon, Friday, Oct. 8. After this time the convention meetings will be over and the exhibits closed. Therefore, inspection trips scheduled from this time will in no way interfere with the convention.

Those who desire to make such inspection trips are urged to schedule them Friday afternoon, Oct. 8, and Saturday, Oct. 9. The manufacturers are requested to make their plans in accordance with the above schedule and thus avoid inspection trips during the time the convention is in session. This, it is believed, will avoid any dissatisfaction on the part of the exhibitors and will not detract from the attendance at the convention meetings.

Information relative to the various inspection trips will be published from time to time and will appear also in the final official convention program.

Transportation and Tickets to the Convention

EVERY trunk line passenger association in the country has authorized the sale of round-trip tickets to the Convention in Cleveland at the rate of one and one-half the single way fare on presentation of the official certificate on purchase of ticket at the local ticket office.

One certificate is good for any member of the association, including dependent members of his family. These round-trip tickets may be purchased for the going trip beginning Sept. 30 to Oct. 6 inclusive. On the return trip the passenger must reach original starting point not later than midnight of Oct. 14 and must make this trip by the same route as the going trip. Regulations of the roads regarding limited trains and stop-over privileges will be adhered to.

Return tickets will be validated at Cleveland, Ohio, by agents at the regular ticket offices of the lines over which tickets read into that city or at the registration desk, where agents will be available from Oct. 4 to 8 inclusive.

A special train, composed of modern, all-steel Pullman equipment for day service will be operated by the New

York Central Railroad from Chicago on the following schedule:

Lv. Chicago 10:30 a.m., C.T., Sunday, Oct. 3
Lv. La Porte 11:51 a.m., C.T., Sunday, Oct. 3
Lv. So. Bend 12:25 p.m., C.T., Sunday, Oct. 3
Lv. Elkhart 12:55 p.m., C.T., Sunday, Oct. 3
Lv. Toledo 4:45 p.m., E.T., Sunday, Oct. 3
Ar. Cleveland 7:10 p.m., E.T., Sunday, Oct. 3

Special Pullmans for delegates only will be reserved for those wishing to leave Chicago at 11:10 p.m., Sunday, Oct. 3, on the Chicago-Cleveland special, arriving in Cleveland at 7:40 a.m., Monday. If enough reservations are made for this train to run as a special, the train will immediately follow the regular 11:10 p.m. train.

Delegates from northern Indiana can have reservations made for the special leaving Chicago at 10:30 a.m., Sunday, Oct. 3, to be taken at La Porte at 11:51 a.m., South Bend 12:25 p.m., Elkhart, 12:55 p.m.

Michigan delegates wishing to leave Detroit Sunday night by boat can purchase round-trip reduced fare tickets to Cleveland and return. These will be honored by the Detroit and Cleveland Navigation Company, leaving Detroit at 11:30 p.m., arriving in Cleveland at 6:45 a.m.

Railroad tickets for these special trains must be secured from railroad companies' ticket agents. Pullman reservations should be made with H. J. Kenfield, vice-chairman transportation committee, 431 South Dearborn Street, Chicago, Ill.

Reserve Seats for Theater Party on Oct. 6

ONE of the entertainment features scheduled for the Cleveland convention is a special theater party to be given at B. F. Keith's Palace Theater

COMING MEETINGS
OF
***Electric Railway and
Allied Associations***

Sept. 9—Central Electric Railway Master Mechanics' Association, annual convention, Hotel Rieger, Sandusky, Ohio.

Sept. 10-11—Central Electric Traffic Association, annual meeting, Yellow Banks Hotel, Webster Lake, Ind.

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Mich.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

November 16-19—American Welding Society, fall meeting and International Welding and Cutting Exposition, Buffalo, New York.

on the evening of Wednesday, Oct. 6. The Palace seats 3,200 persons and is Cleveland's finest vaudeville theater. Every seat has been reserved for dele-

Cleveland Convention Facilities Progress



WORK continues to be rushed on the additional facilities for the coming convention and exhibit in Cleveland. The third view of the work, from approximately the same point as those published in this paper last week, shows 25 bays of steel erected, the plastering and roofing almost completed. Plumbing and service lines are all installed. More than 60 per cent of the concrete floor is in place, only the area in the immediate foreground re-

maining to be done. Meeting rooms are ready for the ceilings and the interior of the structure shown for the placing of service lines and equipment. At the right, the Cleveland Railway is completing the paving of the tracks in East Third Street, which provide the connection between the steam roads and the convention and service facilities. This picture was taken Friday afternoon, Aug. 20, seven days after the last one published.

gates and their guests so that a 100 per cent A.E.R.A. evening is assured. Moving pictures taken at the convention will be shown, while a number of the acts will deal with convention celebrities and convention events.

In addition to these special features, several of the country's outstanding entertainers have been engaged and at least nine of the best vaudeville acts will be selected from other Keith theaters in Ohio. Transportation facilities have been arranged to bring these performers to Cleveland and an all-star entertainment is anticipated.

The committee in charge has mailed a notice to all members of the association. Seat reservations at a fixed price of \$1.50 each may be made in advance. These reservations will be assigned strictly in the order of receipt—first come, first served. While the theater has ample capacity, early reservations are essential to assure the best seats.

Fred Dell, director of exhibits of the American Electric Railway Association, reported that at the close of business of Aug. 27 the total square footage assigned to prospective exhibitors at the convention to be held in Cleveland in October was 114,393 sq.ft.

News of Other Associations

Central Master Mechanics to Meet in Sandusky on Sept. 9

NOTICE has been sent out to members of the Central Electric Railway Master Mechanics Association that the next meeting has been set for Sept. 9. It will be held at the Hotel Rieger, Sandusky, Ohio, beginning at 9 a. m. Eastern standard time.

The meeting will be devoted to four-minute talks by members telling of their greatest accomplishments during the past year. A representative of the Kuhlman Car Company will explain what was accomplished by purchasing freight cars in a bulk order.

In the afternoon the standards committee and the safety appliance committee will present reports, following which an inspection will be made of the Sandusky shops of the Lake Shore Electric Railway.

Central Traffic Men Meet Sept. 10-11

IN ACCORDANCE with the action taken at its last meeting, the next regular meeting of the Central Electric Traffic Association will be held at the Yellow Banks Hotel, Webster Lake, Ind., on Sept. 10-11.

The morning session on Sept. 10 will be called to order at 9 o'clock and will be in the nature of a round-table discussion. Necessary committee work will be done the same afternoon. The session of Sept. 11 will be devoted to reports of committees and such other business as may be properly presented.

The News of the Industry

Wage Terms Fixed in Detroit

The tentative wage increase for the platform men of the Department of Street Railways at Detroit, Mich., announced the latter part of June, which provides an advance of 2 cents an hour, was put into effect after having been agreed to by the employees. It has been estimated that the increase will cost the department approximately \$210,000 annually, but no increase in fares has been necessary and no increase is anticipated as a result of the added cost of operation due to the wage increase.

The tentative agreement provided that the wage increase should take effect in two steps of 1 cent each, on July 1 and Aug. 1, so the full effect of the increase will be included in the report of operating expenses for the month of August.

The tentative agreement provides the following rates for motormen, conductors and motor coach operators: First six months, 67 cents an hour; second six months, 71 cents an hour; thereafter, 75 cents an hour. The hourly rate for one-man car operators and operators of motor coaches or buses seating 35 passengers or more are: First six months, 72 cents; second six months, 76 cents; thereafter, 80 cents.

A number of special requests and provisions were included affecting scheduled weekday runs, the percentage of total number of runs to be completed within certain specified consecutive hours, and the allowance of additional time bonuses for long runs.

Local Service Withdrawn in Delaware, Ohio

City service at Delaware, Ohio, was discontinued on Aug. 20 by the Columbus, Delaware & Marion Electric Company in keeping with its declaration that the moment street improvements on thoroughfares traveled by the city cars were begun the service would stop. Preliminary work on West William Street was started on Aug. 19 and the next day the cars were missing from the city streets.

Since June, 1899, the company has been operating the cars as a requirement of its franchise for right-of-way over Delaware streets for interurban cars. The franchise expired in 1924, but the company continued to operate the cars. When the City Council proposed street improvements, the company served notice it could bear none of the cost and that the cars would be taken off. The company has, however, offered to operate buses in lieu of the cars. Whether or not the city will make any effort to compel the continuation of the operation of the cars is unknown, but such action is not deemed likely.

The company contends that the lines paid \$13 over operating expenses in January, 1914, but that this was the only month in the 27 years of operation by the company that they more than broke even.

The lines were built by a company of Delaware citizens in 1891 at a cost of \$91,000. A few years later they were sold at sheriff's sale to another Delaware company for \$13,500. In 1899 they were purchased by the Columbus, Delaware & Marion Railway, the predecessor to the Columbus, Delaware & Marion Electric Company, for \$55,000.

Matters remained unchanged for several days. Now, however, the City

Council is considering a new franchise presented by the railway and definite action probably will be taken at a meeting of the Council called for Aug. 30. One provision of the new franchise is the installation of a bus service by the railway to take the place of the city street cars, recently discontinued. Under this plan the Council will have the privilege of fixing the fare, but if the fixed rate fails to care for operating expenses in any one month the company reserves the right to increase the fares by steps of 1 cent at a time until operating expenses are met. In no case, however, is the fare to exceed 12 cents. After a reserve fund of \$5,000 has been built up, fares will be lowered.

\$187,000,000 for Rapid Transit at Detroit

Piecemeal Construction of System Suggested—Assessment Plan of Payment for Construction Proposed—Equipment to Be Bought With Funds Secured by Bonds

AN INITIAL rapid transit system proposed for the city of Detroit and adjacent municipalities costing \$187,789,000 and involving a total of 46.6 miles is recommended by the Rapid Transit Commission in its report just submitted to the City Council. The plan calls for four lines, covering routes in both north and south and east and west directions. Of the 46.6 miles of route proposed, 42.7 will be in Detroit, and of the total construction cost, \$172,001,000 is to be borne by Detroit.

The four routes include: Vernor Highway Crosstown line 11.2 miles long, which it is planned to build as the first unit; the Woodward-Fort North and South line, 7.5 miles long; the Salina-McGraw-Grand Boulevard-St. Jean-Crosstown line, 14.3 miles long; and the Grand River-Jefferson-Mount Elliott-Gratiot-West Side and East Side line, 13.6 miles long.

The routes will be submitted to the voters at the November election and if the plans are approved the last step essential to the rapid transit system will have been completed.

Under the plan announced the taxpayers as a whole will pay 17 per cent of the construction costs; property adjacent to the subways and the stations will pay 51 per cent, and 32 per cent of the cost will be borne by the car riders, the law providing that a rate of fare shall be charged sufficient to meet that proportion of the cost.

It is proposed to make each year's budget for the next ten years carry an item of \$4,300,000 for subway purposes, all of which is to be raised by taxation; \$12,900,000 will be raised annually for the next ten years by special assessments levied against property adjacent to the lines.

As only construction costs of the

railroad structures are included in the above figures, mortgage bonds will be issued to buy equipment. These bonds will not be a lien against the city but rather against the equipment itself. The commission reports that the \$172,000,000 construction estimate covers the cost of the railroad structure through the streets, either under, above or on the surface, or the cost of the so-called "permanent way" of the lines in Detroit. This is the cost in which the Detroit public is chiefly interested because the money to meet it must be raised by local assessment and taxation of the city at large.

The commission further states in its report that the cost of equipping the lines for operation, with tracks, signals, cars, power, yards, shops and other equipment appurtenances and for right-of-way real estate will be paid for by the passengers' fares. The equipment bonds will therefore be self supporting.

Among the conclusions set forth by the commission are that the initial system, except for a short length of elevated line made desirable by the exigencies of location, should be constructed as a two-track tunnel way system—that is to say, in subway at stations and in tunnel between stations, thus avoiding the disturbance of the sub-surface structures in the streets to a very large extent, and reducing to a minimum the interference with street traffic during the prosecution of construction work.

It is recommended that because of the limitations imposed by the rapid transit act, a continuous construction program be followed and that work be started in the first year on the Vernor Highway Crosstown line, and in each year thereafter on one of the other lines, in succession and in the order noted previously and that the work be

prosecuted continuously so that all of the lines may be completed and placed in operation within the thirteenth year of the construction period—the first within six years, the second within eight years, and the last two within twelve and thirteen years respectively after the construction work begins.

It is recommended that the cost of constructing and equipping the initial system be financed under the "pay as you go" assessment plan already approved by the people by a referendum vote, in order that all of the beneficiaries of such a rapid transit system, the taxpayer, the land owner and the rider, may each pay his proper share of the cost of the system and the service on it.

After studying the commission's recommendations the City Council unanimously carried a motion that the ordinance be placed on order of first and second reading, and a date for a public hearing on the report will be set in the near future.

Safety Move by New York Interurban

As a result of the inquiry conducted by the Public Service Commission relative to speed of interurban cars operated by the Schenectady Railway between Albany and Schenectady, N. Y., the company has agreed to limit the running time of express trains between the two cities to 30 m.p.h. and of local trains to 26 3/4 m.p.h. The railway will also place on its poles at 1,000-ft. distances warning signs to motorists with the legend: "Warning, Motorists! Be careful if you cross railroad tracks."

Strike Leader at Indianapolis Apprehended

No action was taken on Aug. 23 by federal authorities relative to bringing Harry Boggs, former president of the Indianapolis street car men's local union, before Judge Robert C. Baltzell of the United States district court for arraignment on a charge of contempt of court. Boggs, it was reported, was desirous of coming into court and entering a plea to the charge.

Boggs is alleged to have incited acts of violence in connection with the strike of the union employees of the Indianapolis Street Railway. He fled from the city shortly before he was cited for contempt of court. He is charged with violating the order of Judge Baltzell, which prohibited any one having knowledge of the order from influencing employees of the railway to violate their labor contracts with the company and go on strike.

Boggs pleaded guilty in the United States District Court on Aug. 25 of a charge of contempt of court in connection with the recent strike. Among other things he was charged with inciting acts of violence by employees of the company by encouraging them to "cut loose." He was charged with violating the order by Judge Robert C. Baltzell which prohibited any acts of violence or other methods of interfering with the operation of the cars. Judge Baltzell took Boggs' case under advisement.

It is understood the court will not

pass sentence on Boggs until Albert Ward, United States District Attorney, returns from a motor trip in the East. Judge Baltzell said he wished to learn more about Boggs' case in order to make his punishment what it should be. Mr. Ward is expected to return by Sept. 1.

In speaking in his own behalf, Boggs told Judge Baltzell that he was appointed president of the local union by Robert B. Armstrong and John M. Parker, two vice-presidents of the national organization, and that he took all his orders from them.

"They called me into a little room every morning before each meeting," Boggs said, "and they told me what to say and do and I did it."

Parker and Armstrong recently were sentenced by Judge Baltzell to 90 days imprisonment in the Marion County jail. They appealed their cases.

Boggs denied that he knew anything about a federal injunction and said that Parker and Armstrong told him he was not violating the law.

The Indianapolis public is hearing little about the strike, even though it never has been called off by the strikers and all attempts to call it off resulted in overwhelming votes in favor of a continuance. There now is no interruption to traffic and for two or three weeks there has been no vandalism.

New York Syndicate Reported to Have Made Proposal to Chicago

An unidentified syndicate of New York bankers, through Judge John Harlan, offered on Aug. 25, to take over Chicago Surface Lines with the bondholders' consent at the present valuation when the franchise expires on Feb. 1. They ask the Mayor for an immediate hearing. They would organize a new company, accept a twenty-year franchise and safeguard present bondholders by refunding all outstanding issues. Prior lien sinking funds bonds senior to the present outstanding bonds would provide the capital for extensions costing \$40,000,000. The syndicate would operate supplementary buses and consolidate with the elevated. They offer to build subways cheaper and faster than other proposals or to lease any city built tubes. The suggestion has aroused a great deal of discussion in Chicago and New York, but the details so far made public are so intangible that except in one or two cases, where the plan has been severely criticised, financiers and others have been loathe to talk about it.

Franchise Requested at Springfield, Ohio

Request for a franchise to operate in the city has been presented to officials of Springfield, Ohio, by the Springfield Suburban Railway. The railway hauls freight to Springfield from Maitland, for two Springfield concerns, The Crowell Publishing Company and The William Bayley Company. Since Feb. 9, 1923, the company has been operated by sufferance, according to City Manager Flack, under a franchise granted originally to the Springfield & Troy Traction Company. This franchise does not expire until March 16, 1928. The

original franchise was granted in 1903 when the first line was built under the direction of former Gov. Asa Bushnell. Later the grant was transferred to the Springfield, Troy & Piqua Traction Company. That company operated the line until Nov. 29, 1916, when the name was changed to the Springfield Terminal & Power Company. In 1922 the road was abandoned following foreclosure proceedings, and in the following year the property was transferred to the Springfield Suburban Railway.

Railway Commissioner Defeated at Nebraska Primary

The Republican primary resulted in a defeat for Thorne A. Browne, chairman of the Nebraska State Railway Commission, and the nomination of John H. Miller, a traveling salesman, who will oppose Floyd L. Bollen, a democratic lawyer, at the election. Mr. Browne was a man of outstanding achievements and ability, who had served seven years as a commissioner following three years as secretary. He handled most of the rate and service cases of the utility with a fairness and understanding of their problems that won regard for him. He wrote the opinion in the Omaha fare case, and that city gave Miller 4,000 majority, a group of socialists leading a fight that made this decision an issue. His defeat, however, was a surprise, as no open opposition developed outside of Omaha. Mr. Browne has resigned from the commission and will begin work on Sept. 15 for the Omaha Chamber of Commerce as its industrial secretary.

New Parking Ordinance Aids Chicago Traffic

Enforcement of the new ordinance which prohibits parking within 50 ft. of traffic signal lights in business districts of Chicago is speeding up the movement of traffic to an unprecedented degree, police and Surface Lines officials say. The restriction is serving to promote better vision at street intersections, facilitate loading of passengers and minimize delay at congested street corners.

A regulation to prevent the blocking of vehicular and pedestrian traffic by building construction companies has also been proposed by the police traffic division.

"Statewide Home Rule Fight Contemplated in Illinois"

Forewarnings of a vigorous statewide fight to place the power to regulate the public utilities of Illinois in the hands of the city governments were given recently between city officials of Peoria, Alton, Kewanee and Jacksonville and Mayor Dever's home rule committee.

Chief among the aims of the conference, announced at that time, was the arrangement of a series of meetings in various cities of the state to spread the gospel of home rule.

Voters are to be urged, it was said, to induce their legislative representatives to take the rate-fixing power out of the jurisdiction of the present

Illinois Commerce Commission and vest it in cities which elect to take it. The proposals for this change, which emanated from the committee on local transportation of the Chicago City Council, have been referred to previously in the *ELECTRIC RAILWAY JOURNAL*.

Under article six of the commerce commission act, a city may vote on home rule but the number of voters required to sign the referendum peti-

tion is excessively large and, even with that, the regulatory powers which cities would have over their utilities is greatly limited.

Mayor Dever explained that if a city was satisfied with being under the commission's orders it might remain there, but if one was not satisfied then the conference wanted to make it possible for that city to do its own rate fixing for public utilities.

Plans for Chicago's Transportation

Subway Advisory Commission Proposes Unified System with \$36,000,000 Program of Rapid Transit Construction—Modern Elevated Structures Favored

CONSOLIDATION of Chicago's rapid transit and surface car systems is considered fundamental in the report of the sub-committee on subways reporting to the local transportation committee of the Chicago City Council. Limited subways in the central part of the city are recommended, the trackage so built as to become elevated upon entering territory in outlying sections, when the damage to abutting property becomes low enough to make the elevated more economical.

The tone of the report is distinctly favorable to modern elevated structures but condemns forcibly the present elevated lines in Chicago and New York which are characterized in the report as noisy in operation and unsightly in their design.

Special assessments to property benefited are definitely stated to be the logical means of financing at least 55 per cent of the cost of the improvements, making due allowance for damage to property directly abutting elevated structures to be constructed. Part of the special assessment may be raised, according to the recommendations, by a voluntary subscription plan, the balance of the construction cost to come from the traction fund providing that such action were allowed by the court.

ESTIMATED COST \$36,400,000

The sixteen recommendations of the report are quite specific. They propose the consolidation into one company of the street railways constituting the Chicago Surface Lines with the Chicago Rapid Transit Company, and that the transportation committee take the initiative and draft such ordinances as are necessary to bring about the consolidation. Such amendment of the State Constitution as is necessary to grant power to the city to make improvements to be paid for in part by special assessment of the property that would be benefited.

As to routes, extensions of the elevated on Ashland Avenue, and on Wells and Polk Streets are planned. A subway on State Street and one on Washington Street, Jackson Boulevard and Michigan Avenue, all main arteries in the traffic plan, are proposed.

In each case the recommendation provides specifically for the method of financing in part by special assessment of property.

In a summary of costs the report

presents an estimate of \$36,400,000 covered by the following general items:

	State Street Subway	Washington- Michigan- Jackson Blv'd Subway	Total
Train level including stations.....	\$16,900,000	\$9,900,000	\$26,800,000
Pedestrian level.....	4,050,000	1,450,000	5,500,000
Total structures.....	\$20,950,000	\$11,350,000	\$32,300,000
Operating equipment.....	3,000,000	1,100,000	4,100,000
Grand total.....	\$23,950,000	\$12,450,000	\$36,400,000

The report, dated August, 1926, was formally presented to the committee at a meeting on Aug. 23. On the following day the sub-committee on traction program met with members of the transportation interests, represented by Leonard A. Busby for the Chicago City Railway and associated lines and Weymouth Kirkland for Henry A. Blair of the Chicago Railways. These companies comprise the Chicago Surface Lines, now operating all of the street railway cars in Chicago. The franchises of these two companies expire Jan. 31, 1927. Britton I. Budd appeared for the Chicago Rapid Transit Company. Banks were represented by Frank O. Wetmore, chairman of the board First National Bank; A. W. Harris, president Harris Trust Company, and J. E. Blunt, vice-president Illinois Merchants Trust Company.

The program of attack in the construction of suitable ordinances and necessary legislation was discussed. Opinion was divided between the necessity of first agreeing on a franchise and then seeking necessary enabling legislation or the reverse of this program. Mr. Blair has heretofore favored the enactment of enabling legislation before considering the context of a franchise, whereas the consensus of opinion seemed to favor first agreeing on the terms of a franchise, then after test at a general election, to seek the necessary enabling legislation. Mr. Kirkland stated that Mr. Blair was willing to co-operate but in his opinion the procedure he favored was one that would produce the best results.

A motion was unanimously passed as an expression of opinion by the conference, that a committee consisting of one member from each of the interests involved meet with the corporation counsel and chairman, D. S. McKinlay, and outline a plan for consideration.

While Chicago Surface Lines officials are not in full accord as to the proper course to be followed in negotiating a

new franchise ordinance, the opportunity for continued delay in the settlement proceedings was removed on Aug. 24 when the City Council voted to permit the company to prepare a list of controversial points to be submitted two weeks hence.

The Council's decision was made during a meeting attended by traction officials, local bankers and Aldermen when a deadlock among the traction representatives threatened to undo much of the encouraging progress recently effected. Henry A. Blair, president of the Surface Lines, requested a delay to permit the various company lawyers to agree on the legislation that will be needed for the new ordinance, but Leonard A. Busby, president of the Chicago City Railway, and Britton I. Budd, president of the Chicago Rapid Transit Company, were in favor of pro-

ceeding with the consideration of an ordinance at once and meeting the legal technicalities as they arose. The elevated lines are not asking a franchise or permission to consolidate with the Surface Lines, but Mr. Budd declared they are willing to go along with public sentiment.

While they were divided on other points, the traction officials and bankers appeared to be of one mind, however, in their attitude toward local regulation of the consolidated transit properties. The sentiment of the majority of them was voiced by Albert W. Harris, chairman of the Harris Trust & Savings Bank, who said that he was in favor of home rule for Chicago, but he was not for home rule if by that was meant the City Council is to run the street railways. He could not raise any money under such a program.

Mr. Budd suggested that inasmuch as the subject is not essential to the settlement the question of regulation be put aside for the time being.

As a result of the co-operative attitude displayed city officials now believe that Chicago will be able to go to the state Legislature next spring and set forth just what enactments will be needed to settle its traction affairs.

No Change at Newark, Ohio

The latest available news from Newark, Ohio, indicates that the transportation situation in that city is unchanged. A citizens' committee is endeavoring to have operation restored on the lines of the Southern Ohio Public Service Company and is urging the City Council to take the initiative. The company has commenced track reconstruction on lines in the heart of the city to take care of the interurban traffic. No final agreement has been reached as regards the return of the street cars. The reasons for the withdrawal of service were reviewed in the *ELECTRIC RAILWAY JOURNAL* of Aug. 14.

New Franchise in Peoria

An ordinance has been adopted granting a twenty-year franchise for railway operation in Peoria, Ill. The Illinois Power & Light Corporation, pending signature of the ordinance by Mayor Louis Mueller, will continue to operate the cars. The company has agreed to pave between rails when necessary, to spend \$150,000 on improvements and to transport city employees free. Efforts made to postpone action until next year were defeated. Plea was made, also, for a tax of 4 per cent of the gross receipts by the city, but opponents pointed out that in cities where such tax was exacted no agreement was made covering paving between rails or other improvements. Several other minor objections were raised by the opponents to the franchise.

Grand Rapids Regrets Mr. Madigan's Retirement

Great regret has been expressed by the Grand Rapids Railway, Grand Rapids, Mich., at the retirement of John C. Madigan, long general superintendent. Mr. De Lamarter, vice-president and general manager of the company, in a few words in the employees' monthly publication says Mr. Madigan will be missed both as an executive and as a friend. He says:

"As a street railway executive, Mr. Madigan has few equals. As a man he is one of the most lovable characters I've ever met."

Both Division 836, Amalgamated Association, and the company's Employees Benefit Association entertained Mr. Madigan at farewell gatherings. At these meetings Mr. Madigan expressed himself well satisfied with the co-operation and loyalty shown him by the organization during his years of service. Mr. Madigan's retirement was recorded in the *ELECTRIC RAILWAY JOURNAL* of July 3.

Matters Still Unsettled in Pontiac

The City Commission of Pontiac, Mich., has failed to take any definite action on a new proposal of the Detroit United Railway, looking towards a solution of the city's transportation problems. The company proposed a plan for construction on South Saginaw Street, the main artery, whereby it would put in double tracks, providing the city absorbed the rest of the cost of the improvement. Investigation of a plan for operation of buses and street cars, in combination, the company stated, involved \$750,000, a sum too large for it to handle at this time.

Car Stop Referendum in Cincinnati

In order to settle a difference of opinion among the car riders, regarding traffic stops at Peebles Corner, one of the busiest terminal points in Cincinnati, Ohio, the Cincinnati Street Railway conducted a referendum on the rear platforms of its cars, the ballots being distributed by the conductors. The car riders were asked to express a preference between the present boarding sta-

tion and the original ones. By a majority of about 2,000 votes the present traffic stops in which the Peebles Corner terminal is used were approved. The traffic stops now in force were made by the railway at the request of the city administration in order to facilitate traffic at that point. Walter A. Draper, president of the railway, has transmitted the results of the election to Col. C. O. Sherrill, City Manager, for consideration.

Armored Money Car for Seattle Municipal Railway

The public utilities committee of the City Council at Seattle, Wash., has approved a request of C. R. Jackson, superintendent of public utilities, for the purchase of a 1-ton armored truck at a cost of \$1,500 for use in transporting receipts of the Municipal Railway from the carhouses to banks and from banks to carhouses. The car will carry an armed guard. It will displace the present system of using a small, worn-out truck fitted with an iron chest. He estimated the cost of employing a regular armored bank truck for this purpose at \$5,010 yearly. The cost to the city for using its old car is \$4,355. Mr. Jackson declared this can be reduced with a new car. The car will also transport tokens and transfers.

Another Store Stages a Sale by Street Car

When the Culbertson's Store at Spokane, Wash., chartered all street cars bound for the downtown district for one hour on the morning of a large annual sale, the Spokane United Railways carried 3,637 passengers for the merchandise concern. Signs reading "Culbertson's Free Car" were carried on the dashboard of each car and anyone who boarded a car was carried free regardless of destination. There was an average of 28 passengers on each car, and the management of the store was well pleased with the results obtained. The usual 7-cent ticket fare was paid by the store to the railway.

Electrification of Virginian Nearing Completion

The work of electrifying the Virginian Railway between Roanoke, Va., and Princeton, W. Va., a project which was embarked upon about the first of the year, will be completed by Sept. 15, and electrically-operated locomotives may be expected to run into the Roanoke yards by that date. Already the huge job of electrifying the Roanoke yards is estimated to be about 80 per cent complete. These yards will be a more important part of the Virginian system after the electrification than they are at present, due to the fact that coal shipments from the West will be brought to Roanoke for classification and weighing before being carried farther eastward by steam locomotives.

Completion of the project will give the Virginian a continuous electrified right-of-way from Elmore, near Mullens, W. Va., to Roanoke, a distance of 134 miles. Operation of electric trains

began over the 36-mile stretch between Elmore and Princeton on Sept. 21, 1925.

The entire electrification project, including the portion of the road between Princeton and Elmore, will cost the Virginian about \$15,000,000.

Rapid Transit for Seattle Reagitated

The City Planning Commission of Seattle, Wash., through its special committee on rapid transit, has completed a report of rapid transit and grade separation and submitted the report to the City Council for its consideration. The committee, headed by William Pitt Trimble, recommends the linking of the present system of surface tracks with subway and elevated lines at a cost estimated at \$4,000,000. The committee believes its recommendations, if followed out, would relieve downtown traffic congestion. The Eighth Avenue South subway, it is estimated, would cost \$1,000,000 and the ordinance which authorizes the condemnation of sites required for broadening Eighth Avenue and to provide entrances to the subway has been prepared for passage. On the Westlake Avenue North program, the municipal railway system has purchased the necessary new rails and requires \$62,000 to relay the tracks and better the roadbed, in order to speed up the street cars and cut down the running time between Times Square and the south end of the Fremont Bridge by several minutes.

The subject of rapid transit for Seattle was reviewed in an article in the *ELECTRIC RAILWAY JOURNAL* for May 29, page 938, and was made the text of an editorial at that time.

Results Reported Under New Tacoma Grant

An improvement in the earnings of the Tacoma Railway & Power Company, Tacoma, Wash., under the new fare basis was reported recently to the City Council in a conference between company officials and City Commissioners, but the increase is said not to have been up to expectations, following the city's agreement to eliminate jitneys. The week of July 26-Aug. 1, which came the nearest to representing conditions contemplated by the transportation agreement, was the best so far computed. Decreased riding over the similar period of last year remains an outstanding feature of the railway reports, but this is accounted for in part by the fact that passes were in full use last year. For the week computed, the decreased riding amounted to 10.1 per cent, while revenues decreased to \$22,422 from \$23,126 for the similar week of last year, or 3 per cent.

Operating of the Tacoma municipal belt lines under the new fare and interchange of transfers with the Tacoma Railway & Power Company during July resulted in an increase in passengers on the municipal line and an increased net passenger revenue. The belt line netted \$3,877 on passenger business during July as against \$3,627 for the similar month of 1925, a gain of \$349 for the municipal line.

No Need Seen for Buses at Fort Smith

R. C. Coffy, vice-president and general manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., declared recently that surveys by the company's engineers and other experts had shown that there was no need for the addition of buses to supplement the car service, since the company already operates cars to practically every portion of the city. He said that when six Birney safety cars were purchased recently it marked a definite policy of the company against buses.

Car and Bus Lines United in Portsmouth

The long, drawn-out struggle for a unified bus and railway transportation system in Portsmouth, Va., has been brought to a conclusion by the passage of an ordinance to that effect by the City Council. The stock and equipment of the Consolidated Bus Corporation has been sold to the Virginia Electric & Power Company. The price involved was more than \$100,000. The Virginia Electric & Power Company will operate buses to Park View, Prentiss Place and the Navy Yard and a double-track railway system to Port Norfolk and Pinners Point.

Wages of Covington Employees Being Arbitrated

Wage increase demands of employees of the Cincinnati, Newport & Covington Street Railway, Covington, Ky., are being arbitrated by company officials and delegates of the men. The employees have set 60 cents an hour as the new wage figure for motormen and conductors. This is an increase of 7 cents an hour over the present scale. The contract between the company and the employees, members of the Amalgamated Association, expired on Aug. 4.

They Certainly Made a Fuss Over Her

A farewell dinner was held on Aug. 18 at the Old Kirk Inn, Beaver, Pa., for Miss Elma C. Graham, chief clerk, who has resigned her position with the Beaver Valley Traction Company to accept the position of educational secretary with the Beaver County Health Association.

The affair was attended by about 40 members of the organization. It was in charge of J. R. Marshall, chairman of the committee. Talks were made by Clinton D. Smith, general manager; J. R. Marshall, superintendent of transportation, and others of the foremen and invited guests. A pen and pencil set, engraved with her initials, was presented Miss Graham as a token of the regard in which she was held by her associates.

Regret was expressed at Miss Graham's departure; she received many congratulations on her ability, and the best wishes of all for her continued success. A dance was held following the dinner. The printed program of the affair, decorated with funny little illustrations, was a knockout.

News Notes

42-Mile Run for One Man Car.—Competition has become keen for the honor of operating the longest one-man car route in Ohio. Significant as was the statement made in the JOURNAL of Aug. 21 that the Stark Electric Railroad was operating a run between Canton and Salem, a distance of about 32 miles, it has since been brought to light that the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio, has been operating a 42-mile line with one-man cars since April 1, 1923.

Relief from Paving Costs Asked.—In accordance with the recent advertising campaign of the Harrisburg Railways, Harrisburg, Pa., against bearing the cost of paving between the street car rails, the company has appealed to a committee of the school board to join it in asking the city to relieve it of the cost of paving in extending the tracks of the company to the New John Harris High School.

Booklet of Instructions from Milwaukee Electric.—With a view to increasing mutual understanding between street car patrons and the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., an illustrated leaflet has been issued by this company which clearly describes just how to use all cars in city service. Illustrations on the inside of the leaflet suggest the observance of instructions which will promote convenience to all passengers in their use of the four different types of cars in use in the city.

School Children to Pay Regular Fare.—Practice of granting reduced fares to school children will be discontinued by the Sioux City Service Company, Sioux City, Ia. The new ruling will require high school pupils of the age of twelve years or more to pay regular adult fares. The 3-cent fare will be charged younger pupils. Fares have been 5 cents and 2½ cents, respectively, for children attending school if they used pass books purchased through the Board of Education. The Board will have to pay the higher rate for those pupils entitled to free transportation.

New Grand Rapids Cars Arouse Wide Interest.—The leadership of Grand Rapids, Mich., in the improved type of electric cars recently put into service by the Grand Rapids Railway is receiving attention in many cities. The papers of that city have reproduced an article from the New York Times commending the company on its progressive policy. In addition one of the local papers, the Grand Rapids Press, has commented editorially on the Times article. The Press characterized the account in the Times as "the occasion of another tribute to the courage and progressiveness of our local utility; and, incidentally, not bad advertising for the Furniture City."

Time-table of Express Bus Service.—A time-table folder showing a map of the new express bus service has been issued by the Northern Ohio Power &

Light Company, Akron, Ohio. The buses run, for the most part, on a twenty-minute schedule. A brief word is said on the folder of the comfort, speed and safety of the new line of service. Special buses may be chartered by private parties for in or out of the city trips.

Trolley Company Wins Stay in Yonkers.—The intended sale of fifteen motor bus franchises by the City of Yonkers, N. Y., has been stayed until Sept. 10 by Supreme Court Justice Taylor, who has taken under advisement an application by the Third Avenue Railway System and its subsidiaries in Yonkers to prevent the sale. Justice Taylor ordered the postponement to give him more time to decide the motion. The railway contends that the buses will compete with its lines and that if the franchises are to be sold they should go to a single purchaser. It is reported that the Third Avenue System intends to buy the franchises and operate buses on those which do not compete.

Tokens and Holder on Sale in Baltimore.—The United Railways & Electric Company, Baltimore, Md., has placed on sale at nearly 100 stores and other locations a holder for the street car fare tokens. It is pointed out that this holder "solves the mystery of the missing token." The holder contains thirteen tokens. It sells for \$1. The token fare in Baltimore is 7½ cents.

Two-Cent Transfer Fee Approved.—The Alabama Public Service Commission has approved application by the Birmingham Electric Company, Birmingham, Ala., of a 2-cent transfer charge for transfer from its Mountain Terrace line to other lines and from other lines to the Mountain line. The company had announced the beginning of through service from the end of the Mountain Terrace line into what is known as the loop district of the city of Birmingham. The 2-cent transfer charge, it was stated, is applied on other similar lines.

Railroad Would Operate Over Interurban.—The Southern Pacific Railroad, San Francisco, Cal., has applied to the Interstate Commerce Commission for authority to operate under trackage rights over the line of the Fresno Interurban Company in common with the Atchison, Topeka & Santa Fe Railway, under lease, as authorized by the commission. The rights would be secured under a rental basis and cover trackage from a point of connection with the Santa Fe near Fresno, a distance of 17.6 miles, for the purpose of affording transportation facilities to agricultural interests. The terms of the rental are not stated.

Denver Tramway Loathe to Resume Service.—The Denver Tramway, Denver, Col., remains firm not to resume car service on Eighteenth Street between the Union depot and Broadway. The territory is being served by buses of the Yellowway company. The business men of the street passed a resolution asking the railway to replace its cars or the city to give the Yellowway company a franchise to operate buses. Something must be done along about Sept. 1 because the bus company is giving a 30-day free service.

Recent Bus Developments

Unusual Sightseeing Tour in Southern California

The Pacific Electric Railway, Los Angeles, Cal., and the Gray Line Motor Tours are operating what bids fair to become one of the most popular sightseeing trips in southern California. It is known as the Movie Studio-Mount Lowe Trip. Its particular appeal to the sightseer lies in the fact that its route traverses Hollywood, passes the palatial homes of famed movie artists, enters the Lasky ranch, home of Paramount Pictures, and climaxes with a trip to Mount Lowe. A trained guide accompanies and explains the various interesting features.

Starting at 8:30 a.m. daily from the Clark Hotel, on Hill Street between Fourth and Fifth, the tour leaves in large upholstered observation coaches through the business section of Los Angeles to Hollywood, passing en route Echo Park, Angelus Temple and the residence of Aimee Semple McPherson. From Hollywood the coaches pass at close hand the palatial residences of prominent motion picture stars, thence over Cahuenga Pass through the San Fernando Valley.

A stop is made at the mammoth picture-making plant and the sightseer may view the working ground and sets of such stars as Theodore Roberts, Pola Negri, Richard Dix, Jack Holt, Lois Wilson and others of equal rank, under contract with Famous Players-Lasky Corporation. The Lasky Ranch, 1,600 acres in extent, is entirely devoted to the production of Paramount Pictures.

After the studio visit the tour passes the new plant of the First National Pictures Corporation. Thence the journey leads to the picturesque foothills of North Glendale, thence into the heart of Glendale.

Leaving Glendale, the route continues through one of the most graphic sections of southern California, over a range of mountains on a newly completed boulevard, entering the aristocratic Flintridge Estates. An inspiring scenic panorama of the lofty Sierra Madre Mountains, later to be visited by rail, is to be viewed upon leaving the Flintridge district.

Then comes Pasadena, entrance to which is made through the Arroyo Seco and over Devil's Gate Dam.

A tour is made through the residential section of Pasadena to Montana and Fair Oaks, where begins the journey to Mount Lowe.

South Shore Line Asks New Bus Route

Petition for a motor coach route between Gary and Hammond, Ind., 10 miles distant from each other, was filed by the Shore Line Motor Coach Company with the Indiana Public Service Commission on Aug. 12. It is proposed to operate from the company's terminal on North Broadway, Gary, over Fifth Avenue and Hemstock

Road to its Hammond bus terminal on State Street. The route would be considerably shorter than the interurban line of the Gary Railways, an associated company, and would also serve additional territory, the petition points out.

Salt Lake-Ogden Line Approved

Utah Public Service Commission Approves Appeal of Interurban to Parallel Its Railway Lines

Bus service is to be established between Salt Lake City and Ogden, Utah, completing the link of bus line connections from Salt Lake City north to the Idaho state line.

The Public Utilities Commission of Utah has issued to the Bamberger Electric Railroad, which operates between Salt Lake City and Ogden, a certificate of convenience and necessity to operate a bus line, independent of its passenger service.

Action has been deferred, however, on the application of the Utah Light & Traction Company for permission to withdraw its service on its railway line to Centerville (a point which is also on the Bamberger line) about 15 miles north of Salt Lake City, in the event the bus line certificate is granted. This application will be treated by the commission as an independent case.

Service on the railroad buses has been ordered restricted to points between Salt Lake City and Ogden north of Centerville. Transportation facilities between Salt Lake City and Centerville were held to be adequate as already established.

Express service on the new line is also to be restricted to prevent it from interfering with the freight business already handled by the Salt Lake-Ogden Transportation Company, which operates a freight truck line between these cities. Only such express as may be handled by the regular passenger coaches without impairment of the passenger service may be hauled by the railroad buses under the commission's order.

In this case the commission overrides the protests by the Davis County School Board, the County Farm Bureau of Davis County, the Davis County Taxpayers' Association, incorporated towns within Davis County, the American Railway Express Company, and the conditional protests of the Utah Light & Traction Company and the Salt Lake-Ogden Transportation Company. The service was favored by the Chambers of Commerce of Logan, Utah and Ogden, Utah.

More than 70 per cent of the passenger service between Salt Lake City and Ogden originates at points outside of Davis County. The maintenance of the road is paid from proceeds of the gasoline tax. The truck service between Salt Lake City and Ogden by the Salt Lake-Ogden Transportation Com-

pany is adequate. The transportation facilities between Salt Lake City and Centerville are adequate. These are the findings made by the commission in overruling and protests and in restricting the express and passenger service.

The commission ruled that there was some public demand for bus service between the two points, but holds to its policy recently established, of granting existing transportation agencies authority to enter the bus field in the hope that private automobile owners may be induced in some measure to patronize the buses, thus enabling the rail lines to regain some of their lost passenger business.

The commission expects the Bamberger Railroad to operate a modern passenger bus system in such a manner as will fully meet the requirements and serve the convenience of the public, not as an auxiliary to its present rail service, but as an independent unit. Jurisdiction is reserved to the commission to enter such supplemental orders as it deems necessary to this end.

Rights of Central New York Operator Restricted

The Public Service Commission on July 30 granted to Herbert M. Parke, now operating bus lines out of Rome, N. Y., a certificate covering the extension of his present routes, but imposed a number of restrictions. He is, for instance, prohibited from carrying local passengers between the terminal in Utica and Deerfield Corners, from point to point in the city of Rome and through passengers between the terminal in Utica and the terminal in Rome.

An application by the Utica Clayville Motor Bus, Inc., now operating bus lines from Utica southerly, for a certificate to operate a line between Utica and Sylvan Beach by way of the State road in Floyd and Marcy and Rome was denied.

Inasmuch as the Parke and the Utica Clayville company's applications covered the same operating territory, both were considered together by the commission. Evidence submitted showed that Parke has been operating bus lines for eight years and that he had never had an accident.

The New York State Railways and the New York Central Railroad opposed the granting of a certificate covering a line between Rome and Utica. The evidence on the hearings was to the effect that the present through service between the two cities was ample, but that there is little if any service to persons wishing to travel between intermediate points in Marcy and Floyd or to Rome or to Utica. Floyd and Marcy town officials and representatives of the Utica State Hospital, Marcy division, urged that a certificate be granted for a bus line along the Utica-Rome river road. The commission held that there was sufficient demand for service to justify the issuance of a certificate. The commission says:

The question is then raised as to which of the operators should receive the certificate. What the Utica-Clayville corporation in reality desires is the right to operate excursion buses from Utica to Sylvan Beach, with the short-haul business as a minor incident. There was little testimony showing the public need of such excursion

business. Parke now not only has the right to carry passengers through this territory but is also authorized to do local business through the territory. He therefore is in a position to offer the traveling public the service that the corporation offers and in addition give local service.

The evidence showed that the New York State Railways operated south of the barge canal and the New York Central between Utica and Rome and that the only competition with these carriers would be on through passengers, which Parke under the certificate must not handle.

Buffalo-Toronto Bus Service

Through de luxe bus service between Buffalo and Toronto, Ont., has been started by the International Bus Corporation, Buffalo, N. Y., a subsidiary of the International Railway, and the Toronto Transportation Commission.

TORONTO--NIAGARA FALLS--BUFFALO

Daily Motor Coach Service

Leave Front and Yonge daily—9 a.m., 2 p.m., 8 p.m.
(Daylight-Saving Time)

Leave T.T.C. Office, Queen and Roncesvalles daily—
9.15 a.m., 2.15 p.m., 8.15 p.m.

Toronto-Niagara Falls, Round Trip \$4.50

Toronto, Niagara Falls, Buffalo, Round Trip .. \$6.75

Leave Niagara Falls daily—9 a.m., 2 p.m., 9 p.m.
(Daylight-Saving Time)

TICKETS GOOD FOR 10 DAYS

\$14.25 TWO-DAY TOUR \$14.25

ALL EXPENSES INCLUDED

TORONTO-NIAGARA FALLS-BUFFALO

Leave Front and Yonge, daily—9.00 a.m. (D.S. Time)

Leave T.T.C. Office, Queen and Roncesvalles—9.15 a.m.

Return next day, arriving at Toronto 6.00 p.m.

Two-day Tour includes motor coach tour, luncheons at The Refectory, Niagara Falls, meals and room at Hotel Touraine, Buffalo, and Sight-seeing Tour of Buffalo.

TORONTO TRANSPORTATION COMMISSION

Operating "THE GRAY LINE" Motor Coach Tours

35 YONGE ST.

Adelaide 8001

Appeal to the Public for Patronage

The route is by way of Niagara Falls. Three round trips are made daily. The International Bus Corporation takes passengers from Buffalo to Niagara Falls, Ont., where tourists are transferred to de luxe buses of the Toronto Transportation Commission. An all-expense tour includes luncheon at Niagara Falls, Ont., and overnight accommodations at the Walker House in Toronto. The round trip fare for the tour, including meals and sleeping accommodations, is \$14.25, while the round

trip fare for transportation alone is \$6.75. Buses leave Buffalo at 7:30 and 11:30 a.m. and 7:45 p.m. The route from Buffalo to Toronto is 119 miles.

Railway Abandons Non-Paying Bus Line.—Another electric railway in Indiana has received permission to abandon its bus service. The Indiana Public Service Commission has authorized the abandonment of the bus line operated between Fort Wayne and the Indiana-Ohio state line by the Fort Wayne, Van Wert & Lima Traction Company. The commission said that the loss sustained by the line from Jan. 1 to June 30 of this year was nearly \$10,000. Every community through which the bus line passes is served by electric railway.

Bus Substitution Upheld.—The Eugene Street Railway, Eugene, Ore., has been upheld in its application to substitute buses for street cars on the Eugene-Springfield run. The route now used by the railway is to be taken over by the Southern Pacific Railroad as a part of its new line upon completion of the Cascades cut-off to Klamath Falls.

Buses to Fill the Gap.—The Bus Transportation Company, a subsidiary of the Denver Tramway, Denver, Col., has asked the State Public Utilities Commission for permission to operate buses between Denver and Arvada, Col., about 8 miles. The tramway lines do not pay. The commission has the matter under advisement. If the right to operate buses is granted, it is likely that during the dull season the tramcars will be taken off and buses will take care of traffic.

Traction Company Leaves Ohio Bus Line.—Lease of the Springfield, Mechanicsburg & Delaware Bus Company was obtained on Aug. 4 by the Dayton & Columbus Transportation Company, the bus subsidiary of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio.

Bus Companies Refused Permits in Milwaukee.—Requests of the American Coach Company and Edwin Kroeling, Menomonee Falls, for permission to operate bus service in the downtown section of Milwaukee, Wis., in competition with the street car and bus lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., were

turned down by the Railroad Commission at a special hearing, at which city officials were also present to oppose the granting of permits. The City Council has adopted the policy of refusing permits to operate buses pending completion of the city-wide transportation survey now under way.

Steam Railroads Oppose Rochester Bus Line.—Claiming that their companies would, perhaps, lose as much as 80 per cent of their business, representatives of two steam railroads, the Dansville & Mount Morris and the Buffalo, Rochester & Pittsburgh, opposed the application of the Rochester Interurban Bus Company, a subsidiary of the New York State Railways, Rochester, N. Y., to operate buses connecting Livonia, Hornell and Long Point. Receivers for the Dansville & Mount Morris claimed that the Erie Railroad, with a line that also parallels the proposed bus route, had withdrawn opposition because of an agreement with the promoters of the bus route.

Recommends Combining Seattle Lines.—Combining of the 24th Avenue Southwest and Admiral Way bus lines of the Seattle Municipal Street Railway, Seattle, Wash., has been recommended by D. W. Henderson, superintendent, who declares that better service can be given by this combine. He also opposed the proposed extension of the Beacon Hill car line, on the ground that this line showed a loss of \$10,000 in 1925 over the previous year.

Decides to Retain Baltimore Bus Line.—The United Railways & Electric Company, Baltimore, Md., has notified the Maryland Public Service Commission that it will continue to operate its bus line between Baltimore and Chesaco Park, a development in the eastern suburbs of the city. The company recently announced that it would not continue the service but later decided to keep the line in operation.

Bus Permit Refusal May Cause Higher Fares.—Permission for the trial operation of city bus service during the months of July, August and September having been flatly refused by the Marinette City Council, the Menominee & Marinette Light & Traction Company, Menominee, Mich., announces that application will be made to the Railroad Commission for an increase in fares and adjustment of service inasmuch as the operation of the railway in that city is being carried on at a loss. An attempt was to be made to determine if the transportation system in Marinette could be placed on a satisfactory basis through the operation of combined railway and bus service.

New Garage for Altoona Buses.—The Altoona & Logan Valley Electric Railway, Altoona, Pa., and the Logan Valley Bus Company, a subsidiary, have taken possession of the new concrete and steel garage adjoining the carhouse. This building houses the fleet of eighteen buses, two tower cars and four service trucks made necessary by the recent buses purchased. Eight new machines were secured during the past few months. The Logan Valley will purchase four more buses for use on the West Tyrone and Nealmont routes in Tyrone. The company plans to abandon 12 miles of track.



One of the Toronto-Buffalo Buses Ready to Start

Financial and Corporate

\$71,718 Increase in Net in Detroit

Interesting Comparisons Contained in Report of Auditor Hauser to the City Officials

The balance of net income of the Department of Street Railways at Detroit, Mich., for the year ended June 30, 1926, was \$613,378 after the payment of sinking fund charges. The balance of net income for the year ended June 30, 1925, was \$541,660. The past year shows an increase in the balance of net income over the year ended June 30, 1925, of \$71,718 or 13.2 per cent.

PASSENGER MOVEMENT IS ON INCREASE

During the past year ended June 30, 1926, 498,881,346 passengers were carried by the rail lines and 17,885,595 by the coach lines, a total of 516,766,941 passengers compared with a total of 458,208,396 passengers carried during the year ended June 30, 1925, divided 454,036,811 rail lines and 4,171,585 coach lines. In other words, the Department of Street Railways carried 58,558,545, or 12.8 per cent more passengers, in the year ended June 30, 1926, than in the year ended June 30, 1925.

Density of passengers, i.e., total passengers per car-mile, is an index of service. In the year ended June 30, 1926, the rail lines operated 55,823,983 car-miles and carried 498,881,346 passengers or at the rate of 8.94 passengers per car-mile, compared with 48,300,107 car-miles operated in the

year ended June 30, 1925, and 454,036,811 passengers carried or at the rate of 9.40 passengers per car-mile, so that a less crowded condition existed in the cars during the year ended June 30, 1926, than in the year ended June 30, 1925, by about 5 per cent.

Speed of service as reflected by the car-miles per car-hour is also another

RESOURCES AND FUNDS AVAILABLE AT DETROIT

Resources and Funds Provided	
Construction bonds voted April 5, 1920	\$15,000,000
Purchase bonds voted April 17, 1922	4,000,000
Detroit United Railway obligation voted April 17, 1922....	17,080,000
Additions and betterments bonds voted April 2, 1923....	5,000,000
Deposits for land sales.....	430,841
Balance of earnings for the period from February 1, 1921, to June 30, 1926, after the payment of (a) operating expenses (b) taxes (c) interest, etc. (d) sinking funds..	4,584,589
Total resources and funds provided	\$46,094,430
Disbursements	
For road and equipment.....	\$44,666,419
For cash—working funds.....	114,600
For material and supplies....	1,017,361
Total disbursements	\$45,798,381
Resources and funds provided in excess of disbursements for capital costs, or amount at June 30, 1926, available for future capital costs.....	\$296,048

index of service. This factor of service for the year ended June 30, 1926, shows an average car speed for the rail lines of 9.4 miles an hour compared with 9.2 miles an hour for the year ended June 30, 1925. The car move-

ment has been speeded up about 0.2 mile an hour.

In the year ended June 30, 1926, the coach lines operated 5,775,695 coach-miles and carried 17,885,595 passengers, or at the rate of 3.10 passengers per coach-mile compared with 1,218,308 coach-miles operated in the year ended June 30, 1925, and 4,171,585 passengers carried, or at the rate of 3.42 passengers per coach-mile.

The coach movement shows an average coach speed for the year ended June 30, 1926, of 9.7 miles an hour.

STATEMENT OF ASSETS

Resources and funds provided in excess of disbursements for capital costs, or amount at June 30, 1926, available for future capital costs, were \$296,048 as disclosed by the accompanying statement. Stated differently, the current and working assets are in excess of the current and working liabilities by \$296,048.

The accrued interest, operating reserves, and sinking fund reserves are all funded with cash and securities 100 per cent, and at June 30, 1926, consist of the following:

Sinking funds for debt.....	\$5,827,880
Special deposits for interest.....	296,584
Injuries and damages fund.....	860,966
Repairs and renewals fund.....	179,283
Total	\$7,164,714

Of this amount \$1,500,000 is loaned on behalf of the Department of Street Railways to the City of Detroit on its demand notes drawing interest at 4 per cent.

These facts are all taken from the report made by William M. Hauser, auditor of the municipal railway system under the direction of H. U. Wallace, the general manager, under recent date to the city and the railway officials.

INCOME AND STATISTICAL STATEMENT OF DETROIT MUNICIPAL RAILWAY

	—Year Ended June 30— 1926	1925
Income		
Operating Revenue		
Railway operating revenue.....	\$23,200,361	\$21,262,763
Coach operating revenue.....	1,340,720	297,754
Total operating revenue.....	\$24,541,081	\$21,560,518
Non-operating income.....	235,034	213,137
Total revenue from all sources.....	\$24,776,115	\$21,773,656
Operating Expenses		
Railway operating expenses.....	\$17,527,553	\$15,261,599
Coach operating expenses.....	1,328,937	300,155
Total operating expenses.....	\$18,856,491	\$15,561,754
Net revenue from all sources.....	\$5,919,624	\$6,211,901
Deduct		
Taxes assignable to operation.....	\$695,128	\$716,414
Other deductions.....	450	485
Interest on funded debt:		
On purchase bonds.....	152,577	158,230
On construction bonds.....	785,875	785,875
On additions and betterments bonds.....	217,682	112,551
On purchase contract (D. U. R.).....	824,909	884,495
Total interest.....	\$1,981,045	\$1,941,152
Total deductions.....	\$2,676,624	\$2,658,051
Net income.....	\$3,243,000	\$3,553,849
Disposition of Net Income		
Sinking Funds:		
For purchase bonds.....	\$133,000	\$133,000
For construction bonds.....	545,742	571,351
For additions and betterments bonds.....	163,360	520,319
For purchase contract (D. U. R.).....	1,787,518	1,787,518
Total sinking funds.....	\$2,629,621	\$3,012,189
Balance for the period.....	\$613,378	\$541,660

COMPARISON OF OPERATING STATISTICS OF DETROIT MUNICIPAL RAILWAY

	—Year Ended June 30— 1926	1925
Railway revenue car-miles.....	55,823,983	48,300,107
Coach revenue coach-miles.....	5,775,695	1,218,308
Railway revenue car-hours.....	5,927,506	5,252,021
Coach revenue coach-hours.....	595,848	.....
Railway revenue passengers.....	370,456,658	338,155,230
Railway transfer passengers.....	128,424,688	115,881,581
Railway total passengers.....	498,881,346	454,036,811
Coach revenue passengers.....	16,740,647	4,171,585
Coach transfer passengers.....	1,144,948	.....
Coach total passengers.....	17,885,595	4,171,585
Total revenue and transfer passengers.....	516,766,941	458,208,396
Railway operating revenue per car-mile.....	41.56 cents	44.00 cents
Coach operating revenue per coach-mile.....	23.21 cents	24.44 cents
Railway operating expenses per car-mile.....	31.39 cents	31.59 cents
Coach operating expenses per coach-mile.....	23.01 cents	24.64 cents
Railway operating revenue per car-hour.....	\$3.91	\$4.05
Coach operating revenue per coach-hour.....	\$2.25	.....
Railway operating expenses per car-hour.....	\$2.96	\$2.91
Coach operating expenses per coach-hour.....	\$2.23	.....
Ratio of transfer passengers to revenue passengers— railway.....	34.67%	34.27%
Ratio of transfer passengers to revenue passengers— coach.....	6.84%	.....
Railway revenue passengers per car-mile operated... coach.....	6.64	7.00
Railway transfer passengers per car-mile operated... coach.....	2.30	2.40
Total railway passengers per car-mile operated.....	8.94	9.40
Coach revenue passengers per coach-mile operated... coach.....	2.90	3.42
Coach transfer passengers per coach-mile operated... coach.....	.20	.....
Total coach passengers per coach-mile operated.....	3.10	3.42
Ratio of railway operating expenses to railway operating revenue.....	75.55%	71.78%
Ratio of coach operating expenses to coach operating revenue.....	99.12%	100.81%

Income of Brooklyn-Manhattan 48 per Cent Over July, 1925

The regular monthly statement of the Brooklyn-Manhattan Transit Corporation for July, 1926, shows an increase in total operating revenue of \$347,595 while the total operating expense increased only \$60,945 over July, 1925. The net income has increased \$241,033, or 48 per cent over the same month last year. The statement follows:

COMPARATIVE STATEMENT OF EARNINGS AND EXPENSES OF BROOKLYN-MANHATTAN TRANSIT SYSTEM

	July, 1926	July, 1925
Total operating revenues	\$4,171,774	\$3,824,179
Total operating expenses	2,572,649	2,511,701
Net revenue from operation	\$1,599,125	\$1,312,477
Taxes on operating properties	282,532	262,206
Operating income	\$1,316,592	\$1,050,271
Net non-operating income	70,703	99,431
Gross income	\$1,387,295	\$1,149,702
Total income deductions	649,714	653,154
Net income	\$737,581	\$496,548

Successor to Cumberland & Westernport Railway Chartered

A charter has been granted the Cumberland & Westernport Transit Company, Cumberland, Md., to take over and carry on the business previously conducted by the Cumberland & Westernport Electric Railway.

The authorized capital stock is 3,930 shares of preferred of no par value and

9,755 shares of common of no par value. The preferred provides for dividends of \$5 per share per annum. The directors named in this charter are David D. Price, James T. Chambers and Thomas W. Price, Frostburg, Md. and Walter C. Capper, Paul L. Hitchins and F. Brooke Whiting.

The application for a charter will be followed later by the reorganization of the railway, which is still in the hands of the receiver. As soon as the recent sale under foreclosure is ratified by the court and the receivership terminated the new company will take hold.

Subsidiaries in Washington to Merge

The City & Suburban Railway, Washington, D. C., and the Georgetown & Tenleytown Railway, controlled by the Washington Railway & Electric Company, may be merged into the parent company in the near future. The stockholders of the W. R. & E. have been called to meet on Oct. 10 to consider the question. Officials explain that this proposal bears no particular significance to the broad problem of bringing about a consolidation of the Washington Railway & Electric and the Capital Traction systems.

The merger of these two subsidiary lines with the Washington Railway & Electric system, it was said, could be carried out under the old merger act of 1900. The only relation the elimination of these two separate companies bears to the question of a general merger is that it represents a preliminary step that would be necessary in a general consolidation.

\$700,000 Indiana Service Issue Offered

A new issue of \$700,000 of 6 per cent preferred stock of the Indiana Service Corporation was offered to investors on Aug. 13 by the Utility Securities Company, Chicago. The Indiana Service Corporation, a subsidiary of the Midland Utilities Company, furnishes electric light and power and city and interurban railway service to 30 communities in and around Fort Wayne, Ind.

The present stock issue will be sold at \$92.50 a share to yield about 6.50 per cent. The last preferred stock of the company was a 7 per cent issue and was sold on the basis of a fraction above the 7 per cent yield. The new 6 per cent stock is on a parity in every respect with the 7 per cent issue, except as to the annual dividend rate and the callable price. Seven per cent stock with a par value of \$2,050,000 is now outstanding.

A controlling interest in the Indiana Service Corporation was acquired by the Midland Utilities Company more than a year ago.

Deficits Pile Up on Toronto Radials

According to the Toronto, Ont., *Star* Con. Gibbons on Aug. 4 deplored the delays on the part of the city in taking over the York Radial Railways.

"We ought to take them over and deal with them afterwards," he said, referring to the settlement of finances and other details involved in the transfer.

A report submitted to the board of control for the eight months ended June 30 showed a deficit on the three lines of \$197,063. The deficits on the individual lines were: Metropolitan, \$102,425; Scarboro, \$30,188; Mimico, \$64,449.

The matter was laid over for a full board.

Con. Gibbons expressed regret that the transfer of these lines should be delayed again and again while these deficits were allowed to pile up.

\$106,441 Surplus Reported by International Railway

The net income of the International Railway, Buffalo, N. Y., for the six months ended June 30, 1926, was \$106,441 compared with a deficit of \$244,015 for the similar period of 1925. The complete statement as made public by the company follows:

INCOME ACCOUNT OF INTERNATIONAL RAILWAY

Six Months Ended June 30	1926	1925
Operating revenue ..	\$5,353,187	\$5,169,779
Operation and taxes..	4,532,241	4,649,752*
Operating income ..	\$820,946	\$520,027
Non-operating income	20,233	17,229
Gross income	\$841,179	\$537,256
Income deductions ..	734,738	781,271
Net income	\$106,441	\$244,015

*Adjusted to include 3c. per hour additional wage paid December 31, 1925, retroactive to January 1, 1925.

Conspectus of Indexes for August, 1926

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares* 1913 = 4.84	Aug. 1926 7.36	July 1926 7.36	Aug. 1925 7.28	June 1926 7.37	May 1923 6.88
Electric Railway Materials* 1913 = 100	Aug. 1926 153.1	July 1926 154.1	Aug. 1925 151.6	Sept. 1920 247.5	Oct. 1924 148.5
Electric Railway Wages* 1913 = 100	Aug. 1926 225.9	July 1926 225.7	Aug. 1925 222.8	Sept. 1920 232.0	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Aug. 1926 203.6	July 1926 203.2	Aug. 1925 201.0	July 1920 256.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	Aug. 1926 208.3	July 1926 207.8	Aug. 1925 204.6	June 1920 273.8	Mar. 1922 162.0
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	July 1926 150.7	June 1926 152.3	July 1925 159.9	May 1920 246.7	Jan. 1922 138.3
Bradstreet Wholesale Commodities 1913 = 9.21	Aug. 1 1926 12.64	July 1 1926 12.74	Aug. 1 1925 14.24	Feb. 1 1920 20.87	June 1 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	July 1926 157.0	June 1926 159.7	July 1925 159.9	May 1920 219.2	Mar. 1922 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	July 1926 166.0	June 1926 167.0	July 1925 168.7	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	July 31 1926 3.603	June 30 1926 3.479	July 30 1925 3.54	July 31 1920 11.118	July 31 1924 3.187
Bank Clearings Outside N. Y. City (Billions)	July 1926 19.12	June 1926 18.93	July 1925 18.71	Oct. 1920 20.47	Feb. 1922 10.55
Business Failures Number	July 1926 1661	June 1926 1574	July 1925 1451	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	July 1926 89.86	June 1926 49.34	July 1925 31.80	Jan. 1924 122.95	Aug. 1925 27.22

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. Previously the wage index applied to 144 railways. The change is due to dropping some roads where the number of trainmen has been reduced to a total of less than 100.

Railway-Bus Merger Terms for New York Approved

The New York Transit Commission issued an order on Aug. 25 permitting the Fifth Avenue Coach Company to purchase all of the common stock, 90,200 shares, of the New York Railways Corporation at \$10 a share. Permission to buy the stock was granted after a two-day hearing. No objection was raised to the purchase.

Elmer Schlesinger of the law firm of Stanchfield, Chadbourne & Levy told Commissioner Godley that the purpose of the sale was to co-ordinate surface transportation in Manhattan. This, he said, was a necessary step in the handling of the present problem.

Commissioner Godley asked Frederick T. Wood, president of the Fifth Avenue Coach Company, whether it would take an issue of bonds to pay for the stock. Mr. Wood replied that the company has a cash surplus sufficient for the purchase of the stock and that it proposed to pay for the stock out of that surplus.

The Fifth Avenue Coach Company and the New York Railways made a joint application for a bus franchise through the New York City Omnibus Corporation last May. In return for the desired franchise the railway, which controls about 75 miles of tracks, proposed to eliminate 25 miles of tracks on which 200 cars are now operated and replace them with buses. It proposes to operate buses crosstown for a 5-cent fare and north and south for a 10-cent fare. It agreed to issue transfers.

The New York Railways lines include the Sixth and Seventh and Lenox Avenue lines, as well as the surface lines on lower Broadway and Lexington Avenue, and the Eighth, Fourteenth, 23d, 34th and 116th Street crosstown lines.

Under a plan of reorganization made public by the company in February, 1924, the total capitalization of the new company was said to be \$41,503,000, a decrease of \$49,863,445 from that of the old company. On this capitalization the annual fixed charges showed a decrease of \$1,129,050, and the annual charges, including interest on income bonds, a decrease of \$1,399,533. The fixed charge securities showed a decrease of \$23,908,898.

Of the old company securities in the hands of the public, totaling \$91,366,445, there remained undisturbed or privileged to conversion bonds in the amount of \$14,653,000. The total which remained undisturbed under the new plan, and which did not carry the conversion privilege, was stated to be \$12,803,000.

No action has yet been taken by the city on the application made in behalf of the companies for bus operating rights. The filing of this appeal, which incidentally was widely misunderstood as to its purport, was made the subject of editorial comment in the *ELECTRIC RAILWAY JOURNAL* at the time.

Twelve-Mile Abandonment Sought.—The Hudson Valley Railway, Glens Falls, N. Y., has applied to the Public Service Commission for approval of a declaration of abandonment of that

part of its line between Lake George and Warrensburg, a distance of 6 miles, and the Thomson and Greenwich line, a distance of 6.27 miles, alleging that those parts of its electric system are no longer necessary for the successful operation of railway or the convenience of the public.

24 per Cent Increase Over 1925 Period for Baltimore Lines

The half-yearly statement of operations of the United Railways & Electric Company, Baltimore, Md., shows that net income for the period, after all deductions, covered dividend requirement, for the six months with \$50,606 to spare. Total increase for the six months compared with the corresponding period in 1925 was \$90,080. Gross revenues showed an increase of \$84,203.

The company's best month in net income of this year so far was May, although the biggest percentage of increase in net income came in January. June, while it showed a small increase in gross revenue and an even smaller increase in net, disclosed a decrease in revenue passengers of 40,245.

STATEMENT OF EARNINGS AT BALTIMORE FOR PERIOD FROM JAN. 1 TO JUNE 30

	1926	Increase		
Passenger revenue.....	\$8,316,898	\$70,774		
Other revenue.....	110,937	13,428		
Total.....	\$8,427,835	\$84,203		
Operating expenses:				
Way and structures.....	\$461,256	z\$48,059		
Equipment.....	471,203	z16,620		
Power.....	744,051	57,627		
Conducting transportation..	2,598,711	z42,917		
Traffic.....	31,944	3,220		
General and miscellaneous..	759,142	15,735		
Trans. for Inv.—Cr.....	x5,385	3,618		
	\$5,060,924	z\$27,394		
Depreciation.....	421,391	4,210		
Total.....	\$5,482,316	z\$23,184		
Net operating revenue.....	\$2,945,519	\$107,387		
Taxes.....	845,354	z187		
Operating income.....	\$2,100,164	\$107,574		
Non-operating income.....	47,736	1,298		
Gross income.....	\$2,147,901	\$108,873		
Fixed charges.....	1,688,070	18,793		
Net income.....	\$459,830	\$90,080		
x Credit. z Decrease.				
Net income by months was as follows:				
	1926	1925	Increase	Per Cent
January.....	\$70,135	\$35,530	\$34,604	97
February.....	27,606	31,032	*	11
March.....	102,917	85,839	17,077	19
April.....	81,049	65,964	15,084	22
May.....	104,860	78,225	26,635	34
June.....	73,261	73,157	103	..
	\$459,830	\$369,750	\$90,080	24

* Decrease.

Service Orders Made at Madison

The Wisconsin State Railroad Commission has ordered the Madison Street Railways, Madison, Wis., to discontinue its railway service on Harrison Street and temporarily discontinue its service on Regent Street until the Regent Street line may be connected with the Breeze Terrace line.

The commission has further ordered the railway to start a bus service from Monroe Street to the Forest Hill Cemetery to replace the railway service. The buses, according to the commission's order, must be scheduled to meet every regular car on the Monroe Street line.

The principal reason for the proposed discontinuance of the Harrison Street line is the undesirable crossing with Keyes Avenue made necessary by the fact that the railway tracks cross the Illinois Central Railroad on a bridge which is much higher than the grade of Keyes Avenue, the latter being adjacent to the right-of-way of the railway.

Mayor A. G. Schmedeman has appointed a committee to confer with the railway with the idea of reaching a settlement whereby this service will not be discontinued. This committee will investigate the matter and report to the Common Council at its next meeting.

Receiver Appointed for Utah Interurban

Upon petition of the Westinghouse Electric & Manufacturing Company, the Utah-Idaho Central Railway, operating between Ogden, Utah and Preston, Idaho, has been placed in the hands of P. H. Mulcahy, general manager, as receiver. Action of the Westinghouse company was based upon a past due indebtedness of \$4,259. The complaint also alleged that the railroad was insolvent and unable to meet its obligations.

According to Joseph Scowcroft, president of the railway, the road's financial difficulties are due largely to the encroachment of the motor truck upon the road's freight business and to heavy losses in passenger business due to the private automobile.

The Utah-Idaho Central line was originally designed as a passenger carrier. With the remarkable popularity of the automobile, however, this business fell off, and efforts were directed towards getting freight traffic. This also decreased with the increased use of the truck, and the earnings of the company were not enough to meet its obligations.

The road was constructed in 1914 and 1915 between Ogden and Preston, a distance of 95 miles. The company also has 3 miles of trackage in Logan, Utah, and 20 miles in branches at Plain City and Quinney, Utah. The estimated value of the property is \$6,000,000. Bonds are said to be held mostly by Ogden people.

Line to Be Dismantled in New Jersey.—The Burlington County Transit Company, Hainesport, N. J., has been ordered by the Northampton Township Committee to remove its rails and roadbed on Main and Washington Streets, Mount Holly, N. J.

\$800,904 in Claims Against Indiana Road.—Claims totaling \$800,904 against the Union Traction Company of Indiana have been filed in the circuit court at Anderson, Ind., by Arthur W. Brady, receiver of the company. The list includes claims accrued against the Union Traction prior to the present receivership. In accordance with an order of the court issued on Feb. 5, the receiver gave notice to all creditors and the claims filed have been examined and audited. Some have been allowed and others disapproved subject to confirmation by the court.

Personal Items

New Officers for Market Street Railway

Announcement is made that at recent meeting of the stockholders of the Market Street Railway, San Francisco, Cal., the following new directors were elected: William M. Abbott, M. McCants, Halford Erickson, A. W. Foster, Samuel Kahn, Hunter Liggett, Jesse W. Lilienthal, Jr., J. J. O'Brien, Moritz Rosenthal, M. B. Starring, George W. Willcutt.

Messrs. Erickson and McCants were elected to fill vacancies made by the resignation of H. T. Scott and the death of Leander S. Sherman.

The resignation of Mason B. Starring as president of the Market Street Railway was tendered and accepted at the meeting of the company's new board of directors. His resignation was offered in deference to the company's new management, the Byllesby Engineering & Management Corporation, and to leave him free to attend to his own large business interests.

The directors elected officers for the current year, but did not elect a successor to Mr. Starring at the present time. Announcement was also made that Samuel Kahn, executive vice-president, will perform the duties of president in the interim.

These officers were elected: Samuel Kahn, executive vice-president; Halford Erickson, vice-president; William M. Abbott, vice-president and general counsel; George B. Willcutt, vice-president and secretary; A. M. Dahler, treasurer; E. M. Massey and M. A. Morrison, assistant secretaries.

Charles S. Stephens Advanced at Honolulu

Charles S. Stephens has been promoted to superintendent of transportation of the Honolulu Rapid Transit Company, Ltd., Honolulu, Hawaii, succeeding Alexander Pratt. Mr. Stephens started with the company as conductor in 1901. He was appointed timer in 1902 and was promoted to assistant superintendent in 1903. He has served in the last-named capacity ever since.

Officers of New Connecticut Bus Company Announced

Announcement has been made of the personnel of the Hartford & Springfield Coach Company, Warehouse Point, Conn., the successor to the Hartford & Springfield Street Railway. Arthur L. Linn, Jr., is the president of the company. The vice-president of the company is A. C. Marshall, a man of wide experience in the bus field and a former bus operator in Florida who still retains some of his interests there although most of them were sold by him to Stone & Webster, public utility operators. The secretary of the company is A. L. Shipman, well-known attorney of Hartford. The general man-

ager is Joseph T. Hambleton, former manager of the railway, under whose guidance and influence the bus policy of the railway was developed. Control of the coach company passed recently to Mr. Linn and his associates.

L. E. Fischer Made Vice-President North American Light & Power Company

L. E. Fischer has been appointed vice-president in charge of operation of the North American Light & Power Company, Chicago.

The new operating executive of this large public utility group was the first general manager of the Illinois Traction System, which railway with its supplemental group of public utility properties was under his management from 1903 until 1909. The experience which fitted him for executive official of the Illinois Traction System at the age of 27 years included preliminary training



L. E. Fischer

in the St. Louis Manual Training School, a B.S. and C.E. degree at the University of Illinois, a term as assistant city engineer at Kewanee, Ill., also as city engineer at Paris, Ill., and later as superintendent and manager of the Danville electric, gas and railway properties of the Illinois Traction System at Danville, Ill.

After his resignation as vice-president and general manager of the Illinois Traction System in 1909, Mr. Fischer established a consulting engineering organization in St. Louis where he has had an important part in the planning, construction and operation of many public utility, civic and industrial engineering projects.

The North American Light & Power Company has recently been reorganized, but its properties will continue as heretofore to be operated as a separate entity, under Clement Studebaker, Jr. president. It serves 700 communities in Illinois, Iowa, Missouri, Kansas and Nebraska with electric light and power, gas and other utility services, and owns the Illinois Traction System, a 500-mile trunk line electric railway in the state of Illinois, with terminus at St. Louis.

Alexander Pratt Retires at Honolulu

Alexander Pratt, for more than 25 years superintendent of transportation of the Honolulu Rapid Transit Company, Ltd., Honolulu, Hawaii has retired from active service. He is one of the real old timers, having been in the electric railway business more than 35 years.

Mr. Pratt was born in Aberdeenshire, Scotland, in 1860, but came to the United States as a young man. After a varied career he started with the old Metropolitan Railway, San Francisco, in 1891 as motorman and gripman. He was promoted to inspector and dispatcher, and on May 18, 1901, he resigned to become superintendent of transportation of the Honolulu Rapid Transit Company, then with its road under construction. His service in Honolulu has been continuous since then until his retirement on Sept. 1, 1926—25 years after the first car was run.

John Luther Advanced with Wisconsin Properties

John Luther, who has been connected with electric railways in Wisconsin since 1901, when he started work with the old Manitowoc & Northern Traction Company, has been appointed superintendent of the railway and motor bus lines of the Wisconsin Public Service Corporation. His headquarters will be at Manitowoc.

For some time past Mr. Luther has held the post of master mechanic with the Wisconsin Public Service Corporation. From trackman he was promoted to motorman and later succeeded James Phair as superintendent of the Manitowoc & Northern Traction Company. When the Wisconsin Public Service Corporation took over the lines he was made master mechanic.

Mr. Luther succeeds Edward Holub, who has been transferred to another division of the corporation. In turn Mr. Luther has been succeeded as master mechanic by Oscar Fricke, who has been with the company since 1920.

J. Frank O'Meara has been appointed assistant secretary to the Public Service Commission of New York to succeed Harold W. Palmer, resigned. Mr. O'Meara has served in the office of the State Comptroller and the fiscal supervisor of state charities and last year was a part of the Senate desk force in which work he had the title of assistant deputy clerk.

G. Gordon Gale, vice-president and general manager of the Hull Electric Company, Hull, Que., has also been appointed general manager of the Gati-neau Power Company, another Canadian International Paper Company subsidiary.

Capt. Victor Topping, who as a Strachcona Memorial Fellow at Yale, has just completed with S. James Dempsey a survey of current methods of study and research in transportation for Yale University, is planning to enter consulting practice in Toronto, Canada. He will be associated in partnership with Henry K. Wicksteed, a noted railway

engineer. The firm will specialize in transportation of various kinds, both on the engineering and economic sides, such as city planning, valuation, rate questions, etc. Captain Topping was at one time engineer of traffic analysis for the Toronto Transportation Commission, which operates electric railroads in Toronto.

Obituary

R. A. Willson

Russell A. Willson, assistant general manager of the Spokane United Railways, Spokane, Wash., died on Aug. 19 after being confined to his home since April with Brights Disease. He has been an executive of the Washington Water Power Company and the reorganized United Railways since 1907 and was one of the oldest men in point of service in the electrical industry.

Mr. Willson went to Spokane in November, 1905, as assistant to D. L. Huntington, then general manager of the Washington Water Power Company. As the commercial department expanded and the railway department grew to require special attention, Mr. Willson became general superintendent of the railway department. This was in 1908. He held this position until 1922, when the Spokane Traction and the W. W. P. railways were consolidated. At that time he was made assistant general manager of the Spokane United Railways.

Mr. Willson was born in 1866 in Ishpeming, Mich. He began his life work at Florence, Wis., as an operator of a stationary steam engine, for a mining company. A season with the Chicago & Northwestern Railroad in surveying work was followed by several years in Milwaukee in various lines of business.

In the early '80's he returned to Ishpeming and took charge of the first electric light and power plant, operated by a mining company there. After two and a half years in Ishpeming he went to Marquette where he had full charge of the city's light and power plant and system for nine years. He constructed this plant.

The Westinghouse Company then sent him west, to Helena, Mont., where he was put in charge of the gas, electric and street railway properties which position he held until 1906, building a new light and power plant while there.

Always interested in things mechanical and the development of new devices and methods in the properties of the electrical and electric railway industry, Mr. Willson advanced a multitude of practical ideas to the local companies at Spokane and patented a number of devices now in general use in the railway and electrical fields.

Augustus Lowry Verner, sales manager of the New York office of the Lorain Steel Company, is dead. He had been in charge of the New York office for the last six or eight years, and in the employ of the company for 25 years. Mr. Verner came to New York from Cleveland. He was 47 years of age.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Four Bids Received for 150 Cars for Philadelphia

Bids were opened on the morning of Aug. 27 at the office of Henry E. Ehlers, the Director of City Transit, for furnishing and delivering 150 steel passenger cars for the Broad Street subway, Philadelphia. There were four bidders: J. G. Brill Company, \$4,039,434; Bethlehem Shipbuilding Company, \$4,092,340; American Car & Foundry, \$4,099,750, and Magor Car Corporation, \$4,150,350. Specifications call for delivery to begin not later than May 1, 1927, these to continue at the rate of not less than 25 a month, so that all deliveries will be completed not later than Oct. 31, 1927. Other details were supplied in an article in the *ELECTRIC RAILWAY JOURNAL* for July 24, page 167.

Detroit Will Combat Jitneys with 50 More Coaches

Fifty additional Graham Brothers 21-passenger motor coaches, bringing the total number in use by the system up to 198, have recently been ordered by the Department of Street Railways of Detroit, Mich. The new units will be run on Woodward and East Jefferson Avenues, in a high-speed express service, to combat the privately owned 7-passenger touring cars, which are at present doing a large jitney business, in spite of the best efforts of the City of Detroit to drive them off the streets.

The bus service will be co-ordinated with that of the street car lines already on these avenues. According to the contract, eighteen coaches are to be delivered within twelve days of receipt of order, and the remainder at the rate of fifteen a week.

Westinghouse Company Will Experiment with Bus

New experimental bus of the Westinghouse Air Brake Company, with special body equipped with delicate re-

cording apparatus, for testing the effect of various brake combinations on heating, service life, etc., under heavy duty on steep grades has been acquired for experimental work.

Rolled Manganese Parts Specified in Philadelphia

As a recognition of the greatly increased longevity which marks the use of chafing or wear plates formed of rolled or forged manganese steel, the city of Philadelphia has included this item in its list of specifications on 150 new cars for the Broad Street subway, bids for which were opened on Aug. 27, as reported in another item on this page. The use of rolled and forged manganese steel parts in electric railway practice is of comparatively recent origin, but very successful results have been obtained upon the properties which have given them a trial. It is possible with this type of steel to materially reduce the dimensions of the wearing parts, since the hardness of the metal and its peculiar resisting power make surface wear almost unheard of.

The chafing wear plates specified for the subway cars in Philadelphia will embody the following parts: Bolster chafing plates, transom chafing plates, motor-nose chafing plates for motor and transom, journal box gibs, pedestal gibs, brake lever chafing plates, brake lever guide wear plates, edge of slots in frame for brake lever guides, edge of horizontal radial brake lever and truck and body side bearing chafing plates.

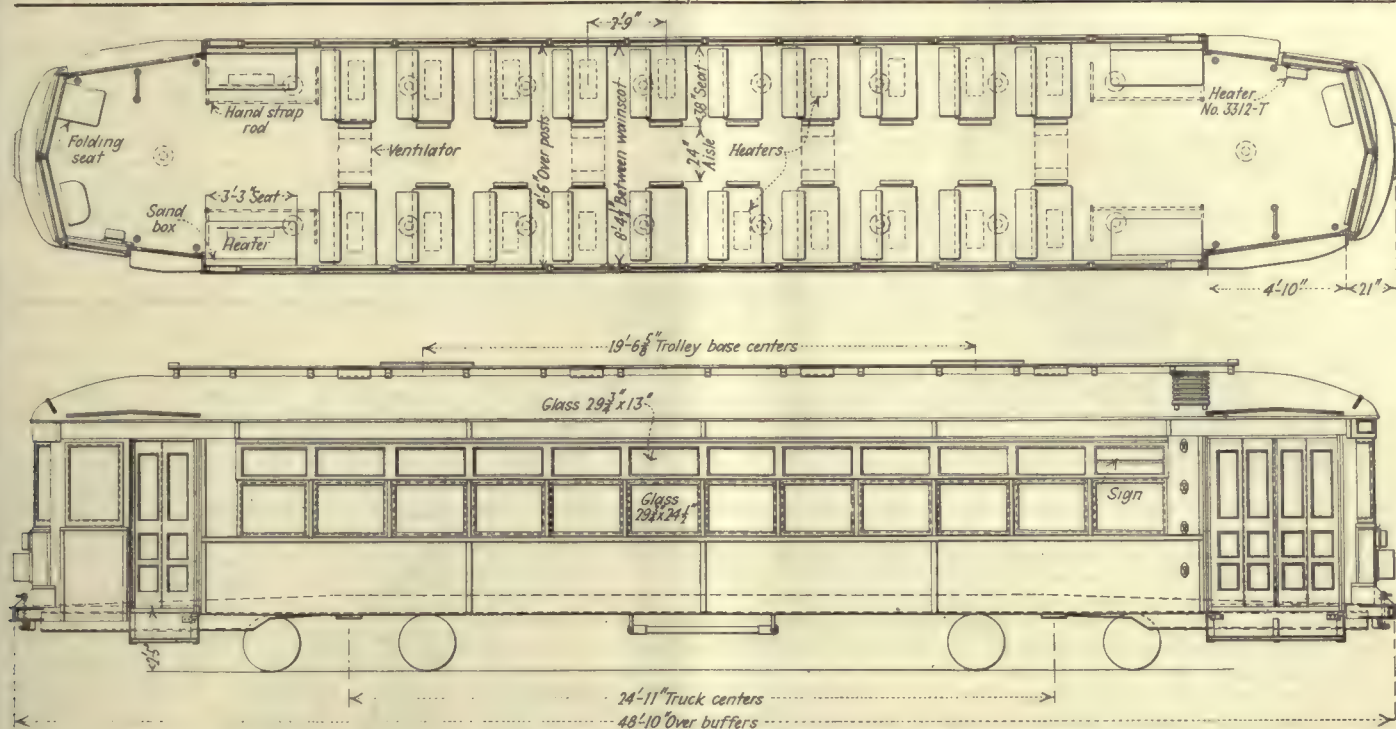
Prices of Mazda Lamps Reduced

A further reduction in the prices of Mazda lamps, effective on Sept. 1, 1926, is announced by the General Electric Company. It amounts to about 7 per cent on the sizes generally used of the new standard line of lamps and approximately 5 per cent on all types.

This is the eighth reduction of Mazda lamp prices since 1920. It means a



Special Experimental Bus Designed for Westinghouse Company



New Cars for Berkshire Street Railway Follow Recommendations of Special Car Committee

saving to the public of approximately \$4,000,000 a year.

The prices of Mazda lamps are now 44 per cent below the 1914 prices as compared with a 65 per cent increase in the average cost of commodities since that year.

The reductions in Mazda lamps prices have been made possible primarily by better manufacturing methods and by standardization and simplification of lamp types.

Berkshire Cars Will Follow A.E.R.A. Specifications for Interurban Units

Some of the first cars to be built according to the standard design adopted by the American Electric Railway Association special committee on the essential features of modern cars are twelve interurban units for the Berkshire Street Railway of Pittsfield, Mass. The cars are being constructed by the Osgood-Bradley Car Company, Worcester, Mass. They will be used in interurban service in the territory served by the Berkshire Company. Seats for 50 passengers are provided in the design. Specifications follow:

Weight 37,000 lb.
 Bolster centers, length 24 ft. 11 in.
 Length over all 48 ft. 10 in.
 Truck Wheelbase 5 ft. 6 in.
 Width over all 8 ft. 8 in.
 Height, rail to trolley base 11 ft. 3 in.
 Body Semi-steel
 Interior trim Mahogany
 Headlining Nevasplit
 Roof Arch
 Air Brakes General Electric
 Armature bearings Plain
 Axles Carnegie Steel Co.
 Bumpers Osgood-Bradley
 Car signal system Consolidated Car Heating Co.
 Car trimmings J. L. Howard & Co.
 Center and side bearings Osgood Bradley Car Co.
 Compressors General Electric CP-27B
 Conduits and junction boxes Osgood-Bradley
 Control General Electric K-35-KK
 Couplers Osgood Bradley
 Curtain fixtures Curtain Supply Co.

Curtain material Pantasote
 Destination signs Electric Service Supplies Co.
 Door operating mechanism National Pneumatic Co.
 Fenders or wheelguards Osgood-Bradley
 Finish Sherwin-Williams enamel
 Gears and pinions General Electric
 Hand brakes National Brake Co.
 Heater equipment Consolidated Car Heating Co.
 Headlights General Electric
 Journal bearings Osgood-Bradley, plain
 Journal boxes Symington
 Lightning arresters General Electric
 Motors Four G.E. 265-A, inside hung
 Registers Ohmer
 Safety Devices Safety Car Devices Co.
 Sanders Osgood-Bradley
 Sash fixtures Curtain Supply Co.
 Seats Heywood-Wakefield Co.
 Seating material Real Spanish leather
 Springs Osgood-Bradley
 Step treads Mason
 Trolley retrievers Earle
 Trolley base US-20-A
 Trolley wheels General Electric
 Trucks OBC-45-66
 Ventilators Garland
 Wheels Wrought Steel A.E.R.E.A.-A-3

New Type Bus Body Designed for Virginia Company

A new type of 21-passenger pay-enter bus body has been designed recently by the Hoover Body Company, York, Pa., for the Virginia Electric & Power Company, Norfolk, Va. The body is mounted on a White 53 bus chassis.

Five units have been ordered for operation in the city of Norfolk.

The most unique of the special features of the new body is the full-length exit door located just back of the wheelhouse on the right side, as is shown in the accompanying illustration. This door facilitates handling passengers during peak-load periods and is mechanically operated from the driver's seat. The frame-work of the body is of oak, while aluminum completely covers all exterior surfaces. A heavy aluminum guard rail encircles the body.

Genuine leather seats are used on the interior, which is made especially attractive by the fact that the metal sections are grained, and that the roof is finished in white ivory.

Business Code Is Widely Adopted

Eight hundred and thirteen chambers of commerce and trade associations have adopted the fundamental code of business ethics formulated by the Chamber of Commerce of the United States. The principles of business conduct were formulated as a general guide for all lines of trade, and were not intended to govern specific customs of any one particular business. The purpose of the code is to establish



Full-Length Rear Exit Door Speeds Up Service During Rush Hours

the principle of self-government in business, and to educate American business men to a sense of the binding force of such principles. Several schools of business administration intend to make this code a part of their curriculum.

Smaller Profits Being Made in Manufacturing

Although the volume of business done by manufacturing corporations is increasing, the profits are decreasing, according to figures given out by the National Industrial Conference Board, New York City. After reducing all data to terms of dollars of 1913 purchasing power so as to take into account the price decline, it appears that whereas the gross income of manufacturing corporations increased 43 per cent during 1919-1923, the net income increased only 9.9 per cent, indicating the declining rate of profit at which these corporations were operating.

Also, whereas the total number of all manufacturing corporations increased 25.5 per cent in those years, those reporting a net income increased only 3.6 per cent, and those reporting no net income nearly doubled in number. However, since the total gross income of those corporations reporting no net income increased approximately only \$1,000,000,000, it would appear that business loss in general has been sustained by those concerns operating on a smaller scale.

While the latest available statistics for the above analysis are for the year 1923, much the same conditions prevailed in 1925 and the first half of 1926 as to the movement of prices, the board declares, making the significance of the 1923 figures applicable to present-day conditions.

Reo Creates Another Sedan Bus

A new sedan type has been added to the line of bus models manufactured by the Reo Motor Car Company, Lansing, Mich. An unusual feature of this model is that it provides a choice by the purchaser of either of two different seating arrangements.

The standard arrangement provides for a 17-passenger bus. There are four cross-seats in wicker, trimmed in Colonial gray leather, with a passenger chair next to the driver's seat. The other seating arrangement converts the bus into a parlor car type of 15-passenger capacity. There is a row of double chairs on one side of the aisle, and a row of single chairs on the other side. The price of the bus is \$5,100, irrespective of the seating arrangement desired.

Patent and Trademark Chart Issued

A chart of patents and trademarks has recently been issued by the National Industrial Conference Board, which shows the number of patents issued in the United States each year since 1850, and the number of trademarks registered annually since 1870, compares their relative growth since the beginning of the present century,

Metal, Coal and Material Prices

Metals—New York		Aug. 24, 1926
Copper, electrolytic, cents per lb.	14.325	
Copper wire, cents per lb.	16.25	
Lead, cents per lb.	8.90	
Zinc, cents per lb.	7.75	
Tin, Straits, cents per lb.	65.125	
Bituminous Coal f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$5.425	
Somerset mine run, Boston, net tons	1.975	
Pittsburgh mine run, Pittsburgh, net tons	1.75	
Franklin, Ill., screenings, Chicago, net tons	1.625	
Central, Ill., screenings, Chicago, net tons	1.50	
Kansas screenings, Kansas City, net tons	2.35	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.25	
Weatherproof wire base, N. Y., cents per lb	18.00	
Cement, Chicago net prices, without bags	2.10	
Linseed oil (5-bbl. lots), N. Y., cents per lb.	12.1	
White lead in oil (100-lb. keg), N. Y., cents per lb.	15.25	
Turpentine (bb'l lots), N. Y., per gal.	\$0.95	

and indicates the status in number of accumulated patents in the United States and the rest of the world. This chart, known as No. 139, illustrates two of the outstanding aspects of the economic development in the past century; the growth of invention incidental to industrial progress, and the increase of trademarking following in the path of organized distribution.

Rolling Stock

Shore Line Motor Coach Company, Gary, Ind., has accepted delivery of ten Fageol six-cylinder parlor car coaches, equipped with Westinghouse air brakes.

Montreal Harbor Commission, Montreal, Que., recently received two of five electric locomotives ordered from England. Each of these engines weighs 100 tons, has four drivers of 250 hp. each and under normal conditions will draw a 3,500-ton train continuously, accelerating to a speed of 16 m.p.h. Each locomotive is capable of taking care of 100 per cent overload for half an hour, and of 200 per cent overload for twenty minutes.

Sacandaga Valley Transportation Company, a subsidiary of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., has purchased a 25-passenger, semi de-luxe bus for operation between the railway terminal at Northville, N. Y., and Lake Pleasant, a 44-mile feeder route through a summer resort section. In winter this bus will be used in city service. The bus was purchased from the International Motor Company, New York, N. Y.

Wheeling Public Service Company, Wheeling, W. Va., is expecting delivery within three weeks of fifteen new street cars ordered some time ago from the St. Louis Car Company, St. Louis, Mo. The cars are to be modern in every respect and will embody many features insuring a special degree of comfort to the passengers. They will replace older type cars which have been operated heretofore in Wheeling.

Chicago & Joliet Electric Railway, Joliet, Ill., is preparing a fleet of ten new interurban cars for service, beginning Sept. 7, between Joliet and Chicago in the Willow Springs district. The first four cars will run between Joliet and Chicago and the others will be extras between Willow Springs and

Chicago. The cars, each of which has a smoking compartment, were manufactured in the Paris, Ill., shops. They weigh only 39,000 lb. as against the 30-ton cars now in service, with the same speed and greater acceleration power. A double end construction type has given four of the cars a capacity of 48, while the others have a 52-passenger capacity.

Trade Notes

Harold M. Graham has been appointed chief engineer of the Ross Heater & Manufacturing Company, Inc., Buffalo, N. Y. In addition to his experience in power plant engineering, Mr. Graham has done considerable research work on the subject of heat transmission and vacuum, which has rendered him an expert in that field.

Elwell-Parker Electric Company, Cleveland, Ohio, manufacturer of electric tractors and trucks, has added to its line a new 5-ton lift tractor, with 27½x60x11-in. platform. This tractor, which is type EP-10, is of very solid construction throughout and is designed for heavy duty in handling loads larger than those usually sustained by electric trucks.

H. F. Darby, Jr., of 1700 Walnut St., Philadelphia, Pa., has been appointed direct factory representative in the Philadelphia district of the Kuhlman Electric Company, Bay City, Mich. Mr. Darby was formerly sales manager of the Cutter Electrical & Manufacturing Company.

J. N. Joyce has joined the Cleveland office of the Bridgeport Brass Company, located at 2017 Superior Viaduct, for the purpose of soliciting sales on Bridgeport-Keating flush valves and Plumrite brass pipe. Mr. Joyce was formerly associated with the Johns-Manville Company.

New Advertising Literature

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued illustrated catalog No. 284 on Rectigon battery chargers. The pamphlet describes the application, operation and construction of radio and private garage Rectigon outfits, home outfits, radio "B" battery charging attachments, telephone Rectigon outfits, 6-amp. 75-volt Rectigon outfits and the 12-amp. 75-volt Rectigon outfits.

Pyle-National Company, Chicago, Ill., has issued the third edition of its general catalog (No. 101) of railway electric equipment. The pamphlet contains information on lighting of railroad yards and locomotives. Oliver wiring appliances for locomotive car and shop wiring are described.

Hauck Manufacturing Company, Brooklyn, N. Y., has issued a booklet describing the new Hauck Venturi suction torch. The distinctive feature of the new torch is that no pressure is maintained on the oil supply tank, thereby eliminating danger of injury to life resulting from a bursting tank.



Provide positive protection for passengers and property

It is not only a duty but also plain common sense for an electric railway to make every possible provision for safety.

To protect its passengers means increased public confidence and eliminates the losses due to damage suits.

To protect its property reduces the cost of maintenance of rolling stock and general repair bills.

To accomplish this result install—

Peacock Staffless Brakes

The chain winding capacity of 144 inches enables them to develop maximum braking power under all conditions. Being light in weight and requiring minimum platform space, these brakes are especially adapted for modern, single and double-truck, light-weight safety cars.

*Let us send you complete particulars
of design and performance.*



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Organized Traffic Relief and Transit Development
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When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

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Address all Mail to Post Office Box 515, Richmond, Va.

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FORGED STEEL AXLES

For Locomotives, Passenger, Freight and Electric Cars
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Noiseless—direct acting—enlarged friction surface—less parts—stronger—more easily and finely adjusted.

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is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we build. That's why so many electric railway men rely absolutely on our name.

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BRAZED **Rail Bonds** **ARC WELD**
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Quick shipment and low prices also on cylinders, valves, torches, regulators and supplies.

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For Motor Busses

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Pullmans are constructed to years of service and safety. Busses must also give years of service and utmost safety. We are doing our part by manufacturing **FRONT AXLES ONLY**. Building in quality that will endure.

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LOUISVILLE, KY.

Member of Motor Truck Industries, Inc., of America



Boyerized Boy pins Old Man Wear-and-Tear's shoulders to the mat!

Without any preliminary feinting the Boyerized Boy and Old Man Wear-and-Tear came to grips in as fierce a catch-as-catch-can match as any of the present generation ever saw.

The wonderful condition of the Boyerized Boy soon began to tell. For he easily stood the terrific pace while Old Wear-and-Tear quickly tired.

Although the result was never in doubt after the first few minutes the quick and decisive victory of the Boyerized Boy was a revelation to old timers who many times had seen ordinary steel parts meet with quick defeat at the hands of Old Man Wear-and-Tear.

This ability to withstand all opposition is the main factor in the popularity of Boyerized Parts throughout the electric railway industry.

Make your selections from the list shown. Then get quotations.



It's
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BOYERIZED PARTS

Brake Pins
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Showing International p. a. y. e.
29-passenger coach

International Harvester Equipment Trucks • Tractors • Coaches



Three-ton International owned by Merchants Heat and Light Company,
Indianapolis, Ind.

22 Years of Automotive Progress

THE International Harvester Company, after twenty-two years of truck manufacture and experience, holds position as one of the two or three leaders in total annual production of high-grade motor trucks. Its thousands upon thousands of trucks, everywhere in the United States, are maintaining a superlative reputation.

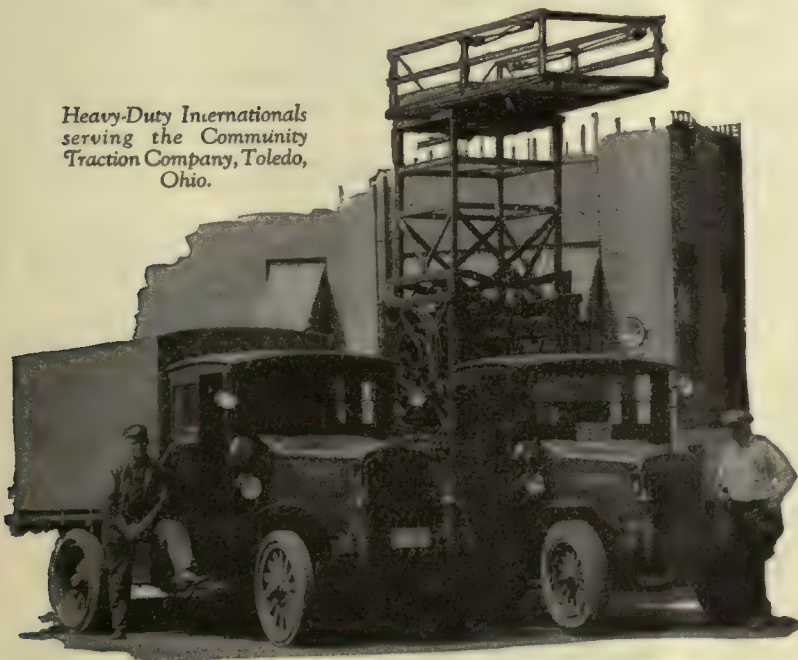
Besides trucks, International Harvester builds motor coaches—for all passenger hauling requirements. The 6-cylinder models, for 24 to 33 passengers, are 4-wheel-air-brake equipped and fitted with every de luxe appointment. The 4-cylinder "SL" coach, for 12 to 14 passengers, brings special flexibility and economy to coach route operation.

McCormick-Deering Industrial Tractors complete the International automotive line. These compact power units are ideal for many trailer hauling jobs and for work around yards, plants, etc. Equipped with spring-mounted front axle and geared for 2, 4, and 10 m.p.h. Wheel and tire equipment for all classes of industrial, commercial and municipal work.

INTERNATIONAL HARVESTER COMPANY

606 So. Michigan Ave. OF AMERICA (Incorporated) Chicago, Illinois

Heavy-Duty Internationals
serving the Community
Traction Company, Toledo,
Ohio.



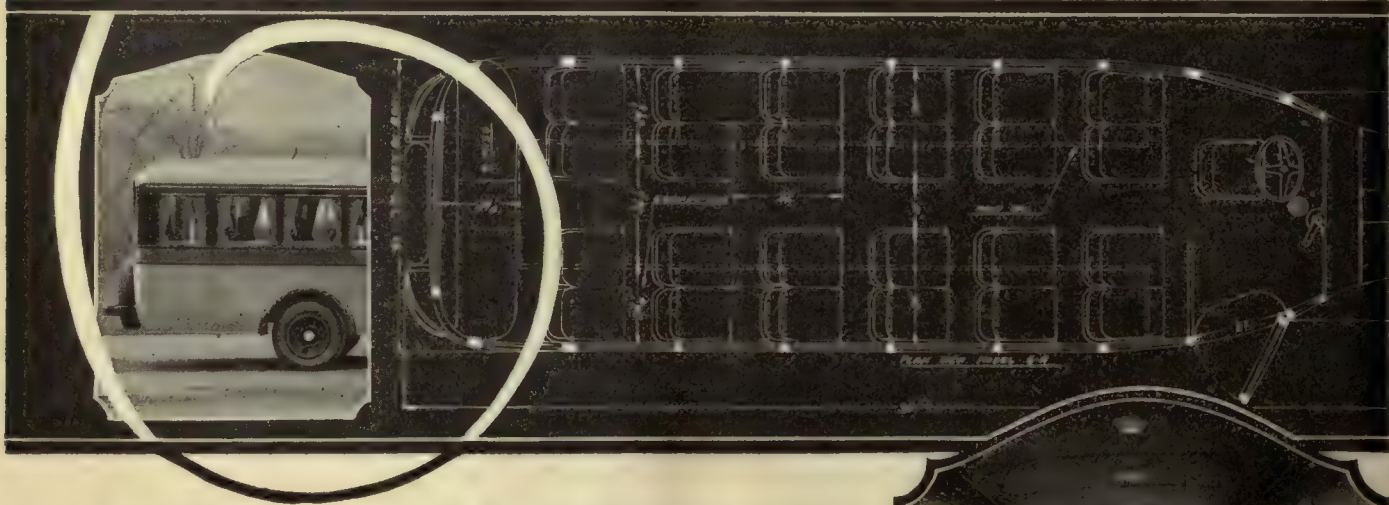
INTERNATIONAL HARVESTER TRUCKS include the new $\frac{3}{4}$ -ton "Special Delivery," the 1-ton Speed Truck, $1\frac{1}{2}$ -ton short-wheelbase "SD" for dump and trailer work, $1\frac{1}{2}$ -ton low-chassis "SL," and Heavy-Duty Trucks ranging up to 5-ton capacities.

Write for information in detail.



Above: A unit of the fleet of the Hoosier Engineering Company which builds steel and wood electric transmission lines all over the United States and standardizes on Heavy-Duty International Harvester trucks. International Harvester branches number 120 in the United States, largest company-owned truck and coach service organization in the world. Hoosier Engineering likes the trucks and this unmatched service. F. H. Miller, vice-president of the company, writes: "We have always considered the ability to obtain satisfactory service in any location as a major reason for standardization."

More Seats



and More Passengers to Fill Them—

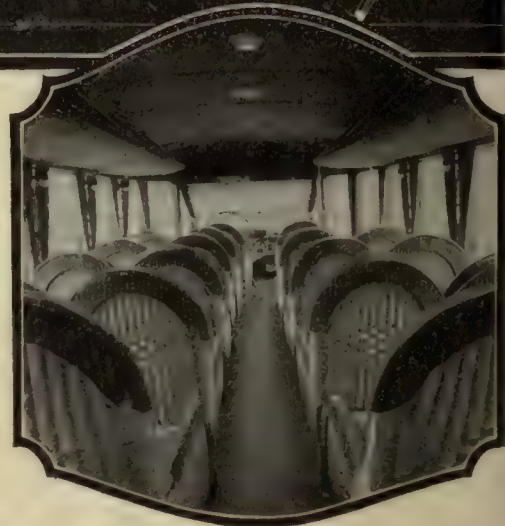
BY improvements in design, Baker-Raulang Bus Bodies of the parlor chair type add more revenue-producing seats on the same length of wheelbase — and by improvements in comfort and convenience, promote public popularity to keep those seats filled.

The B-R Luggage Loft provides ample space for all luggage above the seats and so saves enough floor space to permit five additional seats.

With an exceptionally attractive roof design, the Luggage Loft, with a hand rail at its edge, allows ample headroom above the aisle for standees where regulations permit this added revenue possibility.

The passenger in the Baker-Raulang Bus rides in a deep-cushioned, comfortable seat, with attractive surroundings. His personal luggage is within easy reach at any time, safe from dust, weather and danger. By his side is a wide window, easy to open or close. When he enters or leaves he has plenty

With the exclusive Baker-Raulang Luggage Loft, the entire floor space of the bus is used for revenue-paying seats.



of room to stand upright and a conveniently-placed hand rail to guide him. He is not annoyed by luggage cluttering the aisle nor by waits while the driver stores or delivers luggage to passengers at every stop. He has a quicker, more comfortable, more convenient journey — and naturally he repeats on that bus line.



BAKER-RAULANG City Pay-Enter type bus bodies present numerous improvements in design and construction giving exceptionally comfortable seating arrangements, an unusually wide aisle, and provisions for quick and easy repairs in case of accident. A strong, comfortable, good looking

bus body with elimination of squeaks, rattles and creaks incident to many bus installations.

Further details on both types of bodies furnished upon request.

Baker
Raulang
BUS
BODIES
TRADE MARK



Summer & Winter



**YELLOW
COACHES**
*operate
at a profit*

for the

**Montreal
Tramways Co.**



YELLOW COACHES

JANVIER, 1926

**LIGNES
de
TRAMWAYS
et
d'AUTOBUS**

**SUR
L'ÎLE DE
MONTRÉAL**



Montreal, Canada, is no place for weaklings when it comes to motor coaches.

Ice- and snow-bound for long months, operating conditions call for plenty of reserve stamina to maintain schedules. Winter grips the roadways and the intense cold frosts the windshields. For months, equipment must buck the severest conditions and, in the late spring when the break-up occurs, the streets are deeply flooded with water—sink holes twelve and eighteen inches deep.

It's a real "he" test, and 23 Type Z, 6-cylinder, 29-passenger Yellow Coaches are meeting it successfully; 8 of these Yellow Coaches went into service in August, 1925. At the end of nine months these had operated an aggregate of 352,000 miles, or 4,900



do make money!

miles per bus per month, and had carried 1,538,000 passengers on a route 5.25 miles long. Fifteen additional coaches of the same make were put into service during June, 1926, and two new cross town routes were established.

Present service consists of:

	Miles	Buses	Minutes Headway
Sherbrooke Street...	7.7	10-14	8-6
St. Hubert Street....	4.75	6-8	9-7
Outremont.....	3.55	3	8

Operating statistics now show an average per month:

	Passengers	Miles	Passengers per Bus Mile
Sherbrooke.....	225,700	64,000	3.57
New routes.....	116,650	41,650	2.80
Total	342,350	105,650	3.24

Operating expenses for the first six months of 1926 were as follows:

Maintenance, including depreciation of equipment, tools, machinery and buildings.....	9.78c. per mile
Transportation.....	15.66c. " "
General expense and administration.....	.5c. " "
Interest.....	2.23c. " "
Total	28.17c. per mile

As motor coach operation in Canada is higher than in the United States, owing to duty taxes, and other contributing causes, the Montreal Tramways Company estimate that it costs them approximately 5 cents more per mile to do business over the border. Thus, compared to costs in this country, the total cost figure would be brought down to 23.17 cents per mile.

Despite the adverse conditions of climate, Yellow Coaches are making money. Earnings on the Sherbrooke Street route approximate 35 cents per mile, and on the St. Hubert route about 30 cents per mile.



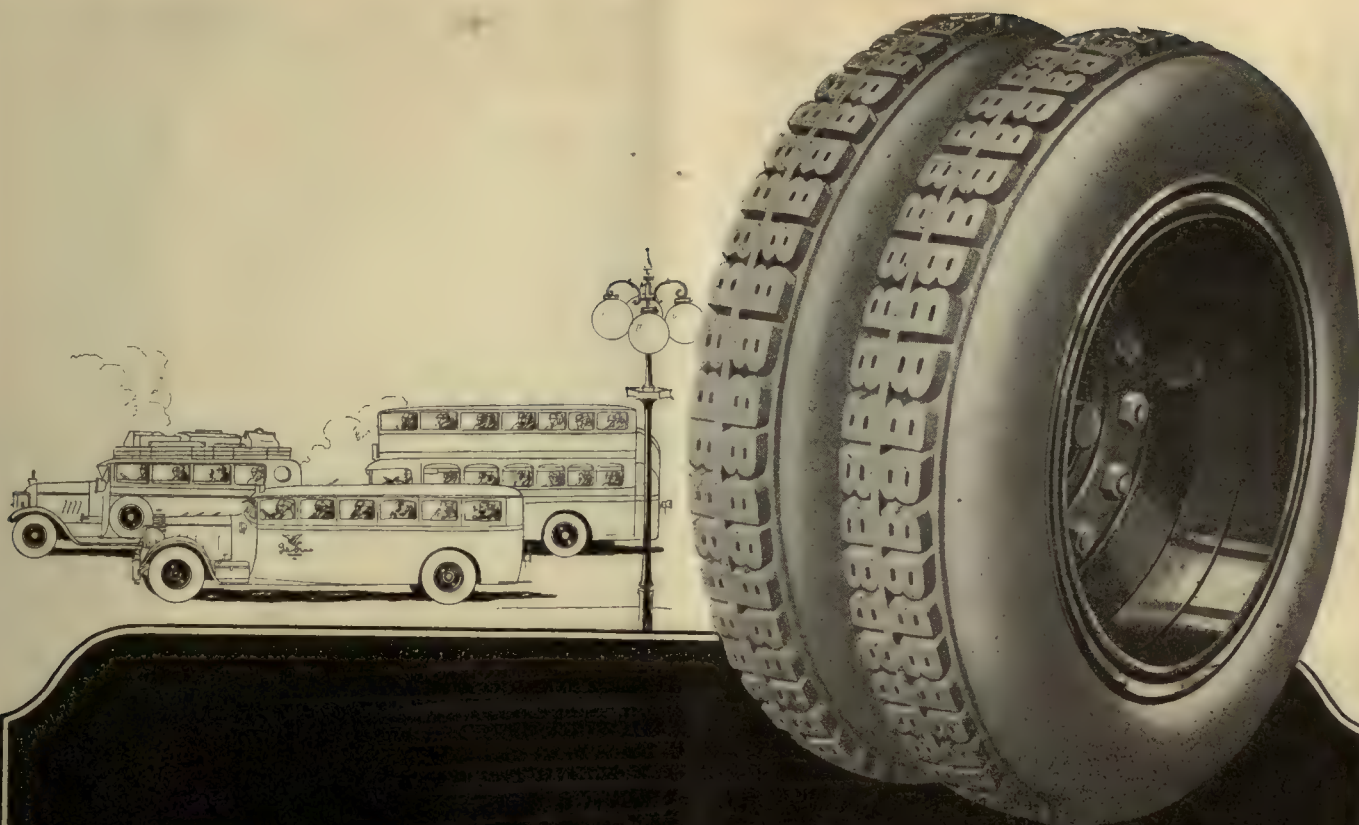
Yellow Coaches, due to the exceptional performance rendered, are widely becoming accepted as standard equipment by leading properties.

This is true in the case of the Montreal Tramways Company where originally four different makes of coaches were operated. With every opportunity to make careful comparisons this Company is standardizing on Yellow Coach equipment.

Such policies of standardization are tributes to the experience and manufacturing standards of Yellow Coach plus General Motors. Within these combined organizations may be found the most intimate knowledge pertaining to every phase of motor coach operation and manufacture. Research, operating experience, modernized methods of manufacture, financial stability; all are available to you.

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.



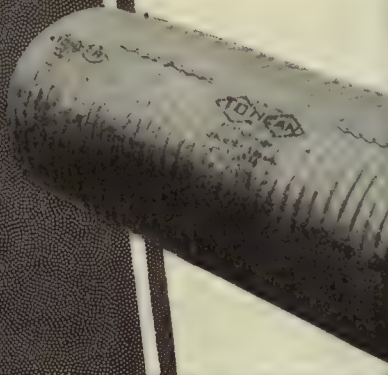
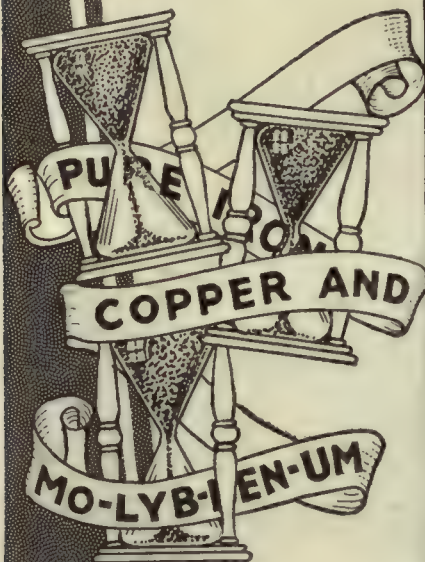


The Budd-Michelin road is paved with *proved* performance. No glamour of newness, no *promise* of performance has ever beguiled experienced bus owners into the detours of experiment.



B U D D
WHEEL COMPANY
Detroit

This Discovery Has Tripled The Life Of Culvert Iron



Scientific alloying of copper and mo-lyb-den-um with carefully refined iron has developed a culvert metal with amazing resistance to rust and corrosion, and tensile strength much greater than any material now used in corrugated culverts. Scores of tests prove it to last from four to fourteen times as long under violent corrosive attack as the best materials hitherto available.

It marks a signal victory in man's age-old battle against rust and corrosion. It is called Toncan Copper Mo-lyb-den-um Iron.

The advantages of easy handling, freedom from breakage, economical installation and supreme strength always have belonged to good corrugated culverts as a class. Now, with this new material, comes a degree of permanence never before attained.

The manufacturers listed below produce Toncan Copper Mo-lyb-den-um Culverts in all standard sizes and also perforated, with tees, elbows, crosses, etc.

They offer you culverts with three times the life at no increase in cost! Write the nearest one.

United Alloy Steel Corp.
Canton, Ohio

The following manufacturers produce Toncan Copper Mo-lyb-den-um Culverts. Write the nearest one.

The Canton Culvert & Silo Co., Canton, O.
Tri-State Culvert Manufacturing Co., Memphis, Tenn.
The Berger Manufacturing Co., Minneapolis, Minn.
The Firman L. Carswell Mfg. Co., Kansas City, Kans.
The Berger Mfg. Co. of Mass., Boston, Mass.
The Philadelphia Culvert Co., Philadelphia, Pa.
The Berger Manufacturing Co., Dallas, Tex.
The Berger Manufacturing Co., Roanoke, Va.
The Berger Manufacturing Co., Jacksonville, Fla.



UNITED ALLOY STEEL CORPORATION



The Proof Is in the Performance

Fifty more Graham Brothers Motor Coaches
for the Department of Street Railways, Detroit.

198 in all!

Proven performance clinched the order!

From the date of the initial sale, a year and
a half ago, these sturdy coaches have delivered
over seven million miles of safe, speedy, low-
cost transportation.

Little wonder this latest order was exclusively
for Graham Brothers product!

21 Passenger Street Car Type Motor Coach Complete

\$3815

f. o. b. Detroit

GRAHAM BROTHERS

Evansville — **DETROIT** — Stockton
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED — TORONTO, ONTARIO

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



Convention Exhibits

Cleveland, Ohio

October 4 to 8, 1926

Present indications are that this year's Convention, which will be held in Cleveland from October 4 to October 8 will be one of the greatest, if not the greatest, in the history of the American Electric Railway Association.

More exhibit space has been sold than in any previous Convention.

Arrangements have been made for larger and more diversified exhibits than at any previous Convention.

All indications point to the greatest gathering of transportation men and the greatest car and equipment exhibit in history.

Interest in new design and new developments has never been keener. Railway men have learned that modern equipment pays. They are alive to the possibilities and to the need of replacing existing obsolete equipment, and are seeking information on parts and equipment that will make possible more modern operation.

Every manufacturer has the four opportunities outlined here to turn this interest into sales.



Convention Number

Electric Railway Journal

September 25, 1926

The Annual Convention Number of *Electric Railway Journal* has been the backbone of a successful Convention sales program since the beginning of Convention exhibits.

Reaching the entire industry one full month before the Convention opens, it anticipates and paves the way for the Convention itself with a comprehensive discussion of the most important subjects before the industry.

This year's issue will be devoted to an authoritative analysis and array of a decade's experience on the most important questions now confronting the industry. Do modern cars and modern methods really pay?

The far-reaching influence of the editorial pages has made the advertising pages of the Convention Number the most valuable medium of Convention selling. Before—during—after the Convention its pages are used as an authentic guide to the industry's important operators and manufacturers.

The manufacturer who uses it adequately and intelligently has assured for his product the maximum attention throughout the industry as well as at the Convention.

There will be a thousand extra circulars at the Convention.

The closing date is September 15, 1926.



Convention Dailies

Electric Railway Journal
(3 Issues)

October 5, 6, 7, 1926

All benefit of Convention attendance with knowledge of daily happenings. Three Convention Dailies are edited on "spot" at Cleveland and will appear on Monday, Wednesday and Thursday at the Convention. These three "Dailies" give the delegates the only news of the daily Conventions and activities. The issues summarize as well, the events of the preceding day and present the program for the current day.

In an intimate manner of treating personalities has made "The Daily" a popular and featured feature of the Convention.

Over 6,000 copies of the Daily are distributed during Convention week. All registered railway men will receive a copy at their breakfast. Additional copies will be distributed at the Auditorium and meeting places.

Use them to stimulate active and immediate action in your exhibit.

Advertising copy and plates intended for use in the three issues of the Daily should be sent to our New York office not later than September 15, 1926.



Convention Report Number

Electric Railway Journal,
October 9, 1926

The Convention Report Number of *Electric Railway Journal* is mailed 24 hours after the close of the Convention.

Carrying the first Complete reports of the Convention, it brings to the returning delegates and to those who were unable to attend, a permanent record of the best thinking and the important developments of the Convention.

The Report Number preserves the worth-while happenings for reference and study. Because it is kept and referred to for months the advertising pages provide "a better than ordinary" opportunity for lasting sales messages.

Competition for the railway man's time is extremely keen. Stimulate and maintain his interest by taking adequate advantage of these four proved sales opportunities.





These books make promotion sure!

See this Library for 10 days FREE

WITH the aid of this library hundreds of ambitious men are stepping into bigger jobs. You have the same opportunity. With a little spare time reading you can have the identical knowledge possessed by the highest paid engineers. They make big money because they know electricity from A to Z. Knowledge counts. With the American Electricians' Library to guide you, you can make promotion sure.

American Electricians' Library

Six Volumes—over 2,000 pages—fully illustrated

No books dealing with the work of the practical electrician were ever so complete—so authoritative—so practical in text and illustrations as these.

The illustrations and wiring diagrams alone represent an expenditure of many thousands of dollars. There are more than a thousand of them—all clearly drawn—all self explanatory—all designed to enable the reader to grasp the information given with a minimum of effort.

The man who puts this set of books into his library can do so knowing that he has the utmost in practical electrical job-books—a set that will give him, in language he can understand, all the information he needs in order to get ahead in his work.

The Standard Work for Experienced Electricians

The American Electricians' Library is accurate, thorough, up-to-date. It is the result of years of experience with electrical problems. The man who has it has the best. The Library covers the whole field. Nothing is omitted. The solution of every problem is plainly worded or explained with a clear diagram or illustration. The little stickers and the big troublesome problems are all worked out in advance for you. There can be only one result from studying these books a few minutes each day—more money in your pocket.

Over a Thousand Wiring Diagrams

The thousand wiring diagrams in these six books are alone worth the price of the entire library to any practical electrician. Many of these diagrams are unobtainable elsewhere; many more are very hard to get from any other source; all of them are much clearer and more helpful than most wiring diagrams available. These wiring diagrams alone make Croft's American Electricians' Library a great set of books.

No money down—small monthly payments

Fill in and mail the coupon below and we will send you the six volumes of Croft's American Electricians' Library for ten days' Free Examination. We take all the risk—pay all the charges. You assume no obligation of any kind. If you find the books to be what you want and decide to keep them, send us \$2.00 in ten days. The balance you pay at the rate of \$2.00 a month until the special price of \$16.00 has been paid.

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McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York.

Ship to me, charges prepaid, the six volumes of Croft's American Electricians' Library, price \$16.00. If satisfactory, I will send you \$2.00 in ten days and \$2.00 a month until the special price of \$16.00 has been paid. If not wanted I will write for shipping instructions.

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There is no substitute for Pantasote

AGASOTE

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The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th Street
250 Park Avenue
NEW YORK



Pantasote Products
for Both
ELECTRIC RAILWAYS
AND
BUSES



A Phoenix Electric Refrigerator Car is actively on the job making deliveries and making money every day of the week. No time is lost in pre-cooling as is necessary with ice refrigerator cars.

In winter, Phoenix Electric Refrigerator Cars serve to protect perishable products against low outside temperatures.

More than 1,000,000 lbs. of meats and other perishable products have been carried in one Phoenix Electric Refrigerator Car in a year.

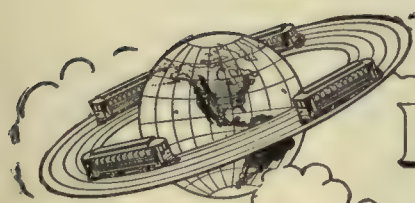
Any standard express or freight car can be easily converted into a Phoenix Electric Refrigerator Car in your own shops. Our Service Department will co-operate with you or with any car builder you may direct.

Do not hesitate to write us on any phase of the subject. Complete descriptive literature on request.



The Phoenix Ice
Machine Co.
Cleveland, Ohio

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

You're having brush trouble

CORRECT IT
USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron
Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.
Pittsburgh Office: 634 Wabash Bldg.
Chicago Office: 1657 Monadnock Block
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Greater Service Per Dollar Invested



"Tiger" Bronze Axle and Armature Bearings

More-Jones "Tiger" Bronze castings for axle and armature-bearing service was one of our early achievements. This is probably the most widely known bronze on the market. It has stood the test of time. There is nothing better for long, efficient and most economical results. Let us quote you.

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES QUALITY PRODUCTS

Griffin Wheel Company

410 North Michigan Ave.
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GRIFFIN F. C. S. WHEELS

For Street and Interurban Railways

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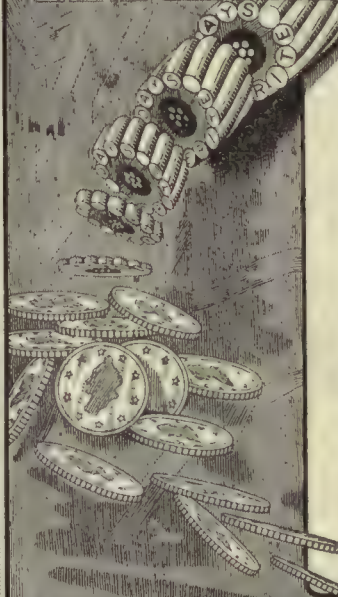
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AN INVESTMENT



When you put your money into KERITE you make an investment in service. You do more than buy conductors, insulation, and protection. You obtain the best possible combination of the most desirable qualities in permanent form. KERITE remains long after the price is forgotten.

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WIRE & CABLE **COMPANY**
NEW YORK CHICAGO



Cold Dinners

for *your* passengers?

Not if you use

AJAX
BABBITT for ARMATURES

keeps the rolling stock rolling



The Ajax Metal Company

Established 1880

PHILADELPHIA

NEW YORK

CHICAGO

BOSTON

CLEVELAND

Business Wants

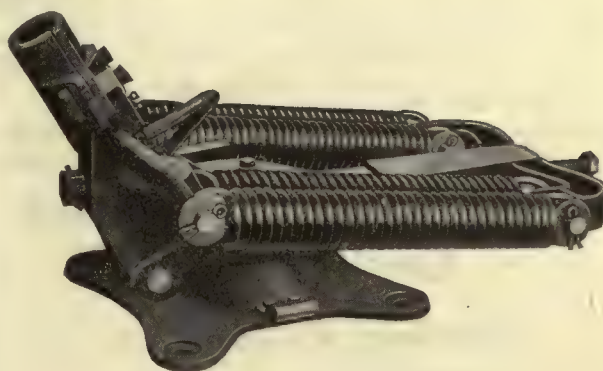
THE *Searchlight* Section of this paper represents a meeting place for men and concerns who have immediate business "wants" to fill—the section covers

Agencies Wanted
Agents Wanted
Books and Periodicals
Business Opportunities
Civil Service Opportunities
Contracts Wanted
Desk Room for Rent or Wanted
Educational
Employment Agencies
Employment Service
Foreign Business
For Exchange
For Rent
For Sale
Franchises
Labor Bureaus
Miscellaneous Wants

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Office Space for Rent or Wanted
Partners Wanted
Patent Attorneys
Patents for Sale
Plants for Sale
Positions Vacant
Positions Wanted
Property for Sale
Representatives Wanted
Salesmen Available
Salesmen Wanted
Spare Time Work Wanted
Sub-Contracts Wanted
Tutoring
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Work Wanted

"SEARCHLIGHT"

Nuttall



The new

Nuttall Form US 20A

Timken Roller Bearing Trolley Base

A really *new* trolley base, simplified and engineered to the same high standards of efficiency and low maintenance as the modern car motor. Incorporates the famous Timken Roller Bearing—a tapered double-race roller bearing designed by this manufacturer especially for trolley base service.

Profitably interesting features include extreme sensitiveness, with swiveling strains evenly distributed on bearings; oil and grease reservoirs for lubrication of bearings and pole socket axle pin respectively; quick, easy lubrication only once in six months.

Full specifications on request.



R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

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Builders since 1868 of
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OFFICIAL PROPOSAL

Bids: Sept. 10.

Track Laying City Hall to and Including Fern Rock Terminal Yard

BROAD STREET SUBWAY
CONTRACT NO. 126
DEPARTMENT OF CITY TRANSIT
CITY OF PHILADELPHIA
11TH FLOOR, 1211 CHESTNUT STREET
Philadelphia, August 16, 1926.

Sealed proposals, addressed to the undersigned, at the office above mentioned, will be received until 11 o'clock a.m. (Eastern Standard Time), on Friday, September 10, 1926, and publicly opened immediately thereafter, for laying track in the Broad Street Subway, the Fern Rock Terminal Yard, and the Shops in the yard.

Plans and specifications may be seen at the office of the Department on the 12th floor, 1211 Chestnut Street, and copies of the same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of Fifty (50) dollars will be required for the plans and specifications. This deposit will be refunded upon return of the plans and specifications in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accompanied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia, to the amount of five (5)

OFFICIAL PROPOSALS

per centum of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

H. E. EHLERS,
Director.

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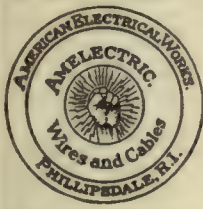
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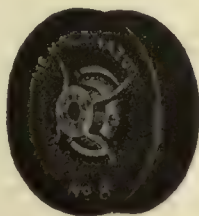
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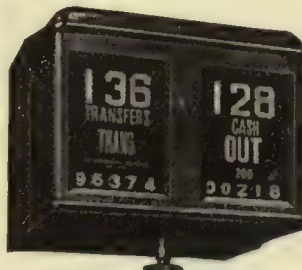


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Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Interior Side Linings**
Haskelite Mfg. Corp.
- Interurban Cars (See Cars)**
- Jacks (See also Cranes, Hoists and Lifts)**
Elec. Service Supplies Co.
National Ry. Appliance Co.
- Joints, Rail**
(See Rail Joints)
- Journal Boxes**
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
- Lamp Guards & Fixtures**
Electric Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Arc and Incandescent (See also Headlights)**
General Electric Co.
Westinghouse E. & M. Co.
- Lamps, Signal and Marker**
Electric Service Supplies Co.
Ohio Brass Co.
- Letter Boards**
Haskelite Mfg. Corp.
- Lightning Protection**
Elec. Service Sup. Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Line Material (See also Brackets, Insulators, Wires, etc.)**
Archbold-Brady Co.
Electric Ry. Equipment Co.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
- Locking Spring Boxes**
Wm. Wharton, Jr. & Co.
- Locomotives, Electric**
American Brown Boveri Elec. Corp.
Cummings Car & Coach Co.
General Electric Co.
Westinghouse E. & M. Co.
- Lubricating Engineers**
Universal Lubricating Co.
- Lubricants, Oil and Grease**
Universal Lubricating Co.
- Manganese Parts**
Bemis Car Truck Co.
- Manganese Steel Castings**
Wm. Wharton, Jr. & Co.
- Manganese Steel Guard Rails**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
- Manganese Steel, Special Track Work**
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.
- Manganese Steel Switches, Frogs & Crossings**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.
Meters (See Instruments)
- Motor and Generator Sets**
General Electric Co.
- Motor Buses (See Buses, Motor)**
- Motor Generators**
American Brown Boveri Elec. Corp.
- Motor Trucks**
International Harvester Co.
- Motors, Electric**
American Brown Boveri Elec. Corp.
General Electric Co.
Westinghouse E. & M. Co.
- Motorman's Seats**
Brill Co., The J. G.
Electric Service Supplies Co.
St. Louis Car Co.
Wood Co., Chas. N.
- Nuts and Bolts**
Bemis Car Truck Co.
Hubbard & Co.
- Oils (See Lubricants)**
- Omnibuses (See Buses, Motor)**
- Oxy-Acetylene (See Cutting Apparatus, Oxy-Acetylene)**
- Oxygen**
International Oxygen Co.
- Packing**
U. S. Rubber Co.
Westinghouse Traction Brake Co.
- Paints and Varnishes (Insulating)**
Electric Service Supplies Co.
Irvington Varnish & Ins. Co.
- Paints and Varnishes for Woodwork**
National Ry. Appliance Co.
- Panels, Outside, Inside**
Haskelite Mfg. Corp.
- Pickup, Trolley Wire**
Elec. Service Supplies Co.
Ohio Brass Co.
- Pinion Pullers**
Elec. Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.
- Pinions (See Gears)**
- Pins, Case Hardened, Wood and Iron**
Bemis Car Truck Co.
Ohio Brass Co.
Westinghouse Tr. Brake Co.
- Pipe Fittings**
Westinghouse Tr. Brake Co.
- Planers (See Machine Tools)**
- Plates for Tee Rail Switches**
Ramapo Ajax Corp.
- Pliers, Rubber Insulated**
Elec. Service Sup. Co.
Nat'l Ry. Appliance Co.
- Plywood, Roofs, Headlinings, Floors, Interior Panels, Bulkheads, Truss Planks**
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- Pole Line Hardware**
Bethlehem Steel Co.
Electric Service Supplies Co.
Ohio Brass Co.
- Pole Reinforcing**
Hubbard & Co.
- Poles, Metal Street**
Elec. Ry. Equipment Co.
Hubbard & Co.
- Poles and Ties Treated**
Bell Lumber Co.
- Poles, Ties, Posts, Piling & Lumber**
Bell Lumber Co.
Naugle Pole & Tie Co.
- Poles, Trolley**
Bell Lumber Co.
Electric Service Supplies Co.
Nuttall Co., R. D.
- Poles, Tubular Steel**
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Electric Service Supplies Co.
- Potholes**
Okonite Co.
Okonite-Callender Cable Co., Inc.
- Power Saving Devices**
National Ry. Appliance Co.
- Pressure Regulators**
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Westinghouse Traction Brake Co.
- Punches, Ticket**
International Register Co.
Wood Co., Chas. N.
- Rail Braces & Fastenings**
Ramapo Ajax Corp.
- Rail Filler**
Philip Carey Co., The
- Rail Grinders (See Grinders)**
- Rail Joints**
Carnegie Steel Co.
Rail Joint Co., The
- Rail Joints—Welded**
Lorain Steel Co.
Metal & Thermit Corp.
- Rail Welding**
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
- Rails, Steel**
Carnegie Steel Co.
- Rail Welding**
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
- Railway Safety Switches**
Consolidated Car Heating Co.
Westinghouse E. & M. Co.
- Rattan**
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Cummings Car & Coach Co.
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Hale-Kilburn Co.
St. Louis Car Co.
- Rectifiers, Mercury**
American Brown Boveri Elec. Corp.
- Refrigerator Cars, Electric**
Phoenix Ice Machine Co.
- Registers and Fittings**
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Electric Service Supplies Co.
International Register Co.
St. Louis Car Co.
- Reinforcement, Concrete**
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Carnegie Steel Co.
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- Repair Work (See also Coils)**
General Electric Co.
Westinghouse E. & M. Co.
- Replacers, Car**
Electric Service Supplies Co.
- Resistances**
Consolidated Car Heating Co.
- Resistance, Wire and Tube**
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General Electric Co.
Westinghouse E. & M. Co.
- Retrievers, Trolley (See Catchers and Retrievers, Trolley)**
- Rheostats**
General Electric Co.
Westinghouse E. & M. Co.
- Roofing, Car**
Haskelite Mfg. Corp.
Pantacote Co., Inc.
- Roofs, Car and Bus**
Haskelite Mfg. Corp.
- Rubber Specialties of all kinds**
U. S. Rubber Co.
- Safety Control Devices**
Safety Car Devices Co.
- Sanders, Track**
Brill Co., The J. G.
Electric Service Supplies Co.
Ohio Brass Co.
St. Louis Car Co.
- Sash Fixtures, Car**
Brill Co., The J. G.
St. Louis Car Co.
- Sash Metal Car Window**
Hale-Kilburn Co.
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- Seating Materials**
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Haskelite Mfg. Corp.
Pantacote Co., Inc.
St. Louis Car Co.
- Seats, Bus**
Brill Co., The J. G.
Hale-Kilburn Co.
St. Louis Car Co.
- Seats, Car (See also Rattan)**
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Hale-Kilburn Co.
St. Louis Car Co.
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Lang Body Co.
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Brill Co., The J. G.
- Shovels**
Brill Co., The J. G.
Hubbard & Co.
- Shovels, Power**
Brill Co., The J. G.
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Consolidated Car Heating Co.
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Electric Service Supplies Co.
Nachod and United States Electric Signal Co.
Wood Co., Chas. N.
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Nachod and United States Electric Signal Co.
Wood Co., Chas. N.
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Elec. Ry. Improvement Co.
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Lorain Steel Co.
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St. Louis Car Co.
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Cummings Car & Coach Co.
St. Louis Car Co.
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- Steel Car Doors**
Morton Mfg. Co.
- Steel Flooring**
Morton Mfg. Co.
- Steps, Car**
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Morton Mfg. Co.
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Westinghouse E. & M. Co.
- Strand**
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Roebling's Sons Co., J. A.
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- Sweepers, Snow (See Snow Plows, Sweepers and Brooms)**
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- Switches and Switchboards**
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Consolidated Car Heating Co.
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- Switches, Tee Rail**
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- Switches, Track (See Track Special Work)**
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Railway Trackwork Co.
- Tapes and Cloths (See Insulating Cloth, Paper and Tape)**
- Tee Rail Special Track Work**
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Wm. Wharton, Jr. & Co.
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Dayton Mechanical Tie Co.
- Ties, Wood Cross (See Poles, Ties, Posts, etc.)**
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- Tongue Switches**
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Hubbard & Co.
Railway Trackwork Co.
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Westinghouse E. & M. Co.
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- Track Grinders**
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Railway Trackwork Co.
Ramapo Ajax Corp.
- Track, Special Work**
Ramapo Ajax Corp.
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- Transformers**
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General Electric Co.
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More-Jones Brass & Metal Co.
- National Railway Appliance Co.**
- Nuttall Co., R. D.**
- Ohio Brass Co.**
- Trolley Bases, Retrieving**
General Electric Co.
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- Nuttall Co., R. D.**
- Ohio Brass Co.**
- Trolley Buses**
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General Electric Co.
Westinghouse E. & M. Co.
- Trolley Material, Overhead**
Electric Service Supplies Co.
More-Jones Brass & Metal Co.
- Ohio Brass Co.**
- Westinghouse E. & M. Co.**
- Trolley Wheel Bushings**
More-Jones Brass & Metal Co.
- Star Brass Works**
- Trolley Wheels & Harps**
Electric Service Supplies Co.
More-Jones Brass & Metal Co.
- Star Brass Works**
- Trolley Wheels (See Wheels, Trolley)**
- Trolley Wire**
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Amer. Steel & Wire Co.
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Anacanda Copper Min. Co.
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Cummings Car & Coach Co.
St. Louis Car Co.
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Baker-Raulang Co., The
- Trucks, Motor**
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(Continued on page 46)

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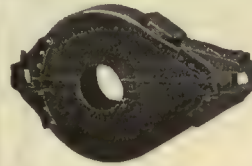
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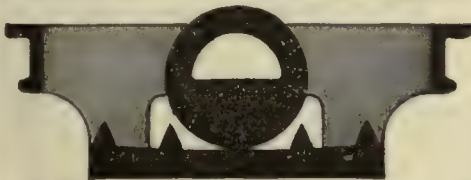


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TOTAL	31.30c.

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	Per Car Mile
Way and Structures...	5.72c.
Maintenance88c.
Power	5.65c.
Conducting Transp....	7.11c.
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